

GOVERNMENT OF IRAQ
(Ministry of Agriculture)

The Lepidoptera of Iraq

by

E. P. WILTSHIRE, F.R.E.S.

1957

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*Under the authority of
The Minister of Agriculture
Government of Iraq*

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THE LEPIDOPTERA OF IRAQ

by E. P. WILTSHIRE.

INTRODUCTION.

AGRICULTURALISTS and students of insects in Iraq are handicapped by the lack of a single publication surveying the country's lepidoptera and distinguishing the harmful from the harmless. The first edition of Bulletin No. 30, published by the Director-General of Agriculture in October 1944 and consisting of an annotated list of 439 Iraqi butterflies and moths is out of print and not generally available; and in any case, about 450 species can now be added to that list. The massive volumes of Dr. A. Seitz's "Macro-lepidoptera of the World" are the best known reference work on this group but are not very practicable for local workers, as they deal with too wide an area and too few families, and are moreover already partly out of date.

Recently the Development Board decided that a general survey of Iraq's fauna was needed as part of the country's development programme; and the Fourth Technical Section of the Board was charged to carry out this project. In view of the importance of many lepidoptera as agricultural pests and of the fact that the insects of this order in Iraq are already fairly well-known (over 900 can now be listed), the Board has quite naturally decided that a second edition of Bulletin No. 30 should be the first publication in such a survey. The present work fills a real need in Iraq and will also be of interest elsewhere in the Middle East and indeed throughout the world; it is hoped that similar surveys of other orders of animals, particularly those of economic interest, will be produced in due course.

This edition is enlarged and revised; it is hoped it will be found to be superior to the first in every respect. The illustrations are better and more plentiful; the Pyralids and Micro-Lepidoptera groups, which were almost completely omitted, are listed at some length, as far as knowledge permits; even in the families dealt with in the first edition, over a hundred species can now be added. Though dealing, therefore, with each species at little greater length, the new edition is quite twice as long as the old.

In the first edition certain species, then considered likely to inhabit Iraq but not confirmed, were listed in brackets. Most of these have since been recorded. The new edition, therefore, contains no bracketed "prophecies".

Harmful pests are denoted with a double asterisk (**). A single asterisk (*) denotes a species known to attack cultivated plants or trees but not yet observed as causing serious economic damage.

Special attention is again given to the ecology, phenology and distribution of the species listed; these aspects of entomology being of supreme importance from the practical point of view.

The Lepidoptera of Iraq have only been studied since World War I. Even now, no complete collection of Iraqi Lepidoptera is to be found in the country, though small collections exist, as at Abu Ghuraib Experimental Farm and the Bagdad Natural History Museum. The bulk of the material, on which the present list is based, having been collected and studied by Europeans, reposes in Europe and has been described to a large extent in

scattered European and Indian publications; the principal exception to this generalisation is of course the first edition of this bulletin, published at Bagdad by the (then) Directorate-General of Agriculture.

It must be repeated that the present list is not intended as a handbook for the identification of the species listed. That would be a far more ambitious undertaking than was possible in the first edition or is contemplated in a faunistic survey. Nevertheless, the larger number of plates now provided does make the second edition more helpful for identifying some of the species than the first. The species selected for illustration are:

1. The principal lepidopterous pests.
2. Species superficially similar to these pests which might be confused with them.
3. Species or forms here described as new to science.
4. Little known species not illustrated elsewhere.
5. Groups of species of similar appearance which might be confused.
6. Some other interesting or striking species.

The plates, incidentally, also illustrate the different modes of variation in pattern (facies). The variability or polymorphism of lepidoptera sometimes leads to errors of identification. A striking example of polymorphism, or ordinary variability, is afforded by the Spiny Boll-worm Cotton-pest adult (Pl. I, Figs. 8-10). Its close relative, the harmless *E. irakana*, has a parallel range of colour forms but they are strictly seasonal (Pl. I, Figs. 5-7).

Seasonal variation in Iraq is quite usual in multivoltine species, and examples of a species which appear in the cool season are often darker, larger, and more richly marked than those of the summer; examples of this are the pest *Laphygma exigua* (Pl. IV, Figs. 4, 5) and *Hadjina viscosa* (Pl. I, Figs. 27, 28).

Sexual dimorphism is also a source of errors; a striking example of this kind of variability is afforded by the male and female of the Fig-tree Pest *Ocnerogyia amanda* (Pl. I, Figs. 2, 3).

Geographical variation is well illustrated by the N. Iraqi and S.W. Persian races of *Minucia bimaculata* (Pl. I, Figs. 22, 23) and *Mamestra rhodocharis* (Pl. I, Figs. 18, 19).

Pl. V illustrates the respective Upper Heights and Middle Heights races of two Cossid moths of the Iraqi mountains. In this kind of geographical variation the distance separating the habitats, though considerable, is less than in the foregoing.

Ordinary variability is also illustrated by the amazing dimorphism of *Dicycla oo* (Pl. I, Figs. 25, 26).

For the twelve plates of line drawings by Dr. Amsel most of which illustrate structural details (Pl. VI-XVII), thanks are due to the Egyptian Society of Entomology, in whose well-known Journal they first appeared in 1949 to illustrate an article by Dr. Amsel on Iraqi Microlepidoptera.

The drawings in the text are by myself. Though I should have liked to illustrate the distinctive tail-parts of many more species, I have been obliged to confine such illustrations to those forms described here as new to science, only adding the diagram of *Cucullia* larval patterns given in the first edition plate.

The following species and forms, new to science, are described in the list and illustrated in the plates:

(No. 170) *Lithosia muscula* Stgr. *brevifurca* subsp. n. (Pl. II, Fig. 14).

(No. 257) *Mamestra rhodocharis* Brandt *herkia* subsp. n. (Pl. I, Fig. 19).

- (No. 297a) *Lithophasia cyaxares* sp. n.
(No. 313) *Antitype carducha* sp. n. (Pl. IV, Fig. 15).
(No. 386) *Epipsammia boursini* sp. n. (Pl. II, Fig. 20).
(No. 443) *Minucia bimaculata* Osth. *pulchrior* subsp. n. (Fars). (Pl. I, Fig. 23).
(No. 576) *Nychiodes rayatica* sp. n. (Pl. III, Fig. 10).
(No. 891) *Cossus cossus* L. *omrana* subsp. n. (Pl. V, Figs. 4, 5).
(No. 891) *Cossus cossus* L. *kossae* subsp. n. (Pl. V, Figs. 1-3).
(No. 892) *Dyspessacossus fereidun* G.-Gsh. *ahmadi* subsp. n. (Pl. V, Fig. 6).

The original descriptions of the four new forms described in the first edition are not repeated here, but illustrations are given in the two cases where this has not yet been done. These four forms are illustrated as follows:

- (No. 422) *Earias irakana* Wilts. f. *vernalis* Wilts. (Pl. I, Fig. 5),
ditto f. *intermedia* Wilts. (Pl. I, Fig. 6).
(No. 334) *Autophila cymaenotaenia* Brsn. *orthotaenia* Wilts. (Wiltshire 1948, ii, Pl. I, Fig. 12).
(No. 903) *Dyspessa bipunctata* Stgr. *brandti* Wilts. (Fars.) (Wiltshire 1946, i, Pl. III, Fig. F).

The list also contains the following new synonymies or nomenclatorial combinations, and one new name of a larval form:

- (1) *Papilio machaon centralis* Stgr., larval form *albicans* (Pl. III, Fig. 3).
(137) *Chondrostega fasciana* Stgr. subsp. *feisali* Wilts. (comb. nov.) (Pl. IV, Figs. 16 and 17).
(389) *Aegle nubila* subsp. *ottoi* Schaw. (comb. nov.).
(301) *Metopodicha* Draudt 1936 = *Persidia* Wilts. 1946, ii. (syn. nov.).
(665) *Irakia pallens* Amsel (1955) = *Dattinia simplicialis* Roths. (1921) (syn. nov.).
Irakia simplicialis, comb. nov.
(681) *Anerastia ablutella* Z. = *Heterographis huxtoni* Roths. (1921) (syn. nov.).
(853) *Amictoides villosa* Brandt. (comb. nov.).
(854) *Amictoides shahkuhensis* Heyl. (comb. nov.).

The list generally omits detailed larval descriptions but gives references to recent publications where these may be found; but the hitherto unpublished descriptions of the early stages of *Caradrina zobeidah* Boursin (370) and of *Scythris bagdadiella* Ams. (803) are given in the list.

In view of the large number of species, an alphabetical index of species-names was considered necessary; it omits subspecific names and synonyms except where their loss of specific rank may not yet be widely recognised.

Another addition, which it is hoped will prove useful, is the index of pests arranged according to hosts. This precedes the specific index.

The list of references and the specific index are given at the end of the list of species.

As regard the systematic order of the species, I have tried to bring the list up to date. Scientific thought now demands that species and higher groups be arranged in phylogenetic sequence starting with the most primitive, though the relationships cannot be perfectly expressed in catalogue-sequence. I have however refrained from putting the super-families in such an order, since it would result in this second edition being in reverse order to the first, which would be confusing; moreover, there is much to be said for starting with the

better known, larger butterflies and moths. The super-families are therefore arranged beginning with the most advanced and ending with the most primitive. Within the limits of each super-family, however, I have endeavoured to follow modern scientific thought, placing the most specialised last. This, perhaps illogical, system produces an order not very different from that of the first edition and also, when taken with this introductory explanation, expressive of modern thought. As to the authorities for the order, in the highest categories I follow Börner (1944), and Hinton (1946), and, at a lower level Warren (1947), Evans (1949), and Hampson as modified by such workers as Boursin and Marion (1954). But for the sake of brevity and simplicity, names of sub-families and sub-genera are omitted.

The representation of the Super-families and Families in Iraq, as listed, is as follows:

	Name.	Place in List.	Number of species in each	
			(Family).	(Super-family).
(Super-family)	Papilionoidea	(1-114)	—	114
(Family)	Papilionidae	(1-6)	6	—
(Family)	Pieridae	(7-28)	22	—
(Family)	Lycaenidae	(29-66)	38	—
(Family)	Libytheidae	(67)	1	—
(Family)	Nymphalidae	(68-89)	22	—
(Family)	Danaidae	(90)	1	—
(Family)	Satyridae	(91-114)	24	—
(Super-family)	Hesperioidea	(115-133)	—	19
(Family)	Hesperiidae	(115-133)	19	—
(Super-family)	Bombycoidea	(134-161)	—	28
(Family)	Saturniidae	(134)	1	—
(Family)	Lemoniidae	(135)	1	—
(Family)	Lasiocampidae	(136-145)	10	—
(Family)	Endromididae	(146)	1	—
(Family)	Sphingidae	(147-161)	15	—
(Super-family)	Phalaenoidea	(162-485)	—	324
(Family)	Syntomididae	(162-164)	3	—
(Family)	Arctiidae	(165-180)	16	—
(Family)	Lymantriidae	(181-188)	8	—
(Family)	Thaumetopoeidae	(189)	1	—
(Family)	Notodontidae	(190-198)	9	—
(Family)	Phalaenidae	(199-485)	287	—
(Super-family)	Anthroceroidea	(486-491)	—	6
(Family)	Anthroceridae	(486-491)	6	—
(Super-family)	Geometroidea	(492-593)	—	102
(Family)	Cymatophoridae	(492-493)	2	—
(Family)	Drepanidae	(494)	1	—
(Family)	Geometridae	(495-593)	99	—
(Super-family)	Pyraloidea	(594-801)	—	208
(Family)	Pyralidae	(594-801)	208	—
(Super-family)	Gelechioidea	(802-851)	—	50

	Name.	Place in List.	Number of species in each	
			(Family).	(Super-family).
(Family)	Scythridae	(802-807)	6	—
(Family)	Momphidae	(808-810)	3	—
(Family)	Gelechiidae	(811-828)	18	—
(Family)	Oecophoridae	(829-838)	10	—
(Family)	Coleophoridae	(839-841)	3	—
(Family)	Pterophoridae	(842-848)	7	—
(Family)	Hyponomeutidae	(849-851)	3	—
(Super-family)	Tinaeidea	(852-905)	—	54
(Family)	Psychidae	(852-854)	3	—
(Family)	Tortricidae	(855-873)	19	—
(Family)	Gracilariidae	(874)	1	—
(Family)	Atychiidae	(875)	1	—
(Family)	Aegeriidae	(876-878)	3	—
(Family)	Tinaeidae	(879-888)	10	—
(Family)	Glyphipterygidae	(889-890)	2	—
(Family)	Cossidae	(891-905)	15	—
(Super-family)	Incurvarioidea	(906)	—	1
(Family)	Adelidae	(906)	1	—
(Super-family)	Hepialoidea	—	—	0
(Family)	Hepialidae	—	0	—
			906	906

After the completion of the manuscript, it was possible to add thirty-three species to the list, bringing the total to 939; these additions are indicated by a letter after their serial number, e.g. a, b, or c. Though inserted in the right place and indexed, they had to be omitted from the analyses above and below.

In general the above figures tell their own tale, but since the more conspicuous groups have received more attention than the groups of smaller species, future exploration will probably add more to the latter (i.e. the groups after the *Pyraloidea*) than the former. When all groups, including the most minute kinds, have been equally thoroughly investigated, the total number of species for Iraq (939) will probably be at least doubled.

The figures can be summarised by saying that, like its neighbours to the east, south, and west, Iraq's fauna is dominated by two families, the *Phalaenidae* (*Agrotidae*) and the *Pyralidae*. These are both comparatively specialised groups and more successful than most others in adapting themselves to dry conditions. The almost total absence of the very primitive groups (i.e. the last two Super-families, which are classed in the sub-order *Monotrysia*) is characteristic of Iraq and other arid Middle East countries, and follows naturally from the fact that insect life originated in a humid habitat. Future exploration of Iraq will doubtless hardly change the striking disproportion of Ditrysia to Monotrysia.

The distribution of these species over Iraq is very uneven, but the explanation of this irregularity is not far to seek. Geography has ordained that Iraq, though its summer is everywhere arid, shall nevertheless possess a striking diversity of biotope.

DISTRIBUTION AND LIFE-ZONES (BIOTOPES)

For most lepidoptera, as for most animals, distribution and appearance are governed by the differences of biotope.

Iraq's biotopes may be classed as follows:

- | | | |
|--|---|--|
| <p>(A) MOUNTAINS
(1500–13,000 ft.)</p> <p>(Area: about 33,500 sq. km.)</p> | } | <ol style="list-style-type: none"> 1. Mountains above tree-line (5000–13,000 ft.) 2. Scrub-forest zone (1500–5000 ft.) <ol style="list-style-type: none"> (a) Woodland (nowhere too dense for use as pasture). (b) Deforested mountain (pasture). (c) Deforested flat ground: <ol style="list-style-type: none"> (i) Arable, unirrigated ("daim") (ii) Pasture (steppe). (d) Oasis: <ol style="list-style-type: none"> (i) Rivers. (ii) Marsh. (iii) Cultivated gardens and fields. |
| <p>(B) PLAIN
(0–1500 ft.)</p> <p>(Area: about 411,000 sq. km.)</p> | } | <ol style="list-style-type: none"> 3. Desert. <ol style="list-style-type: none"> (a) Stony desert and foot-hills: <ol style="list-style-type: none"> (i) Pasture. (ii) Arable, unirrigated ("daim"). (b) Alluvial desert, often salty. 4. Oasis. <ol style="list-style-type: none"> (a) River banks and islands. (b) Marshes. (c) Cultivated gardens and fields: <ol style="list-style-type: none"> (i) irrigated by lift or diversion. (ii) watered by tidal lift. |

The sub-montane or intermediate tracts between the two main biotopes A and B naturally have a flora and fauna transitional between the two; nevertheless these two main divisions are fundamental, and more significant than some which have been suggested by phytogeographers; for instance, the northern limit of date-palm cultivation is about latitude 35° N. (a line drawn from Anah to Taza Khourmatu), and some writers have subdivided the plain accordingly, terming the region to the north of this line "Iranian-Turanian" and to the south of it "Saharan-Sindian". The distribution of Iraq's lepidoptera shows this to be an over-simplification and I prefer the scheme shown above. It approximates roughly to the rainfall zones. Rainfall is heavier towards the north and east, where the ground, after its gradual fall from Syria, rises into the foot-hills and mountains. The isohyets are reflected in vegetation and agriculture; cereals, for instance, cannot be grown without irrigation south and west of the Jebel Hamrin (which crosses the plain at an angle to the palm-limit, being mostly to the north of it, and aligned from north-west to south-east). The heaviest rainfall is that of the mountains.

Oasis localities are usually ambiguous, being inhabited by animals typical of the oasis and by some also typical of adjacent country (e.g. Rowanduz Gorge, combining the flora and fauna of river (2, d (i)) and woodland (2, a); Bagdad, combining those of river (4, a), irrigated cultivated (4, c (i)), and desert (3, b).

Localities with most vegetation have the greatest variety of lepidoptera. Thus the Middle Heights of the mountains, with mixed woodland, oasis and steppe biotopes are richest in variety of species.

A biotope may be said to be a primary biotope when its vegetation is autochthonous and at its natural climax. Where man has modified the vegetation by cutting, charcoal-burning, ploughing, planting, or grazing, it becomes a secondary biotope. Strictly speaking, there are few primary biotopes left in Iraq; but it is convenient to regard places not quite deforested or over-grazed as primary, and places where the vegetation consists mostly of crops, or planted trees, as secondary.

The species of lepidoptera peculiar to a primary biotope, such as woodland, peak, or desert, are usually of little economic importance. The more pestilential species are, as a rule, those able to adapt themselves to several biotopes, and especially favouring secondary biotopes, such as cultivated oases. Many of the worst pests are both polyphagous and migratory, which makes their eradication difficult and like the labours of Sisyphus.

The list gives, under each species, firstly its distribution in Iraq, and particular biotope; secondly, its foodplant and phenology; and thirdly, its range outside Iraq, or geographical status. (The third particular was omitted in the first edition.)

The prevalence and importance of every species is dependent on the interplay of external factors indicated under these three headings. The factors are ecological, but it should not be forgotten that each species inherits from its ancestors various specific faculties, adapting it ill or well to differences of climate and of biotope, and to particular host-plants, etc. These faculties are fixed and characteristic for each species but can, exceptionally, change, as for example when a species adapts itself to a new foodplant.

The list uses certain terms, for the sake of brevity, since they recur again and again, in describing the phenology, ecology and foreign range of the numerous species. Since the reader may be unfamiliar with some, definitions explaining them are given below, the geographical ones separately:

GLOSSARY OF ECOLOGICAL AND PHENOLOGICAL TERMS

Biotope. An area of land characterised by a community of plants and animals (*ecofauna*) to some extent interdependent.

Bivoltine. With two generations in a year.

Ecology. The study of the way an animal's environment affects its existence.

Habitat. The locality inhabited by an animal.

Monophagous. Feeding on one kind of foodplant only.

Multivoltine. With three or more generations in a year.

Oligophagous. Feeding on a few kinds of foodplant only.

Phenology. The study of the time and season of an animal's appearance.

Polyphagous. Feeding on many kinds of foodplant.

Univoltine. With one generation in a year only.

ECOLOGICAL AND PHENOLOGICAL ADAPTATIONS.

The specialisation of many lepidoptera in diet (foodplant) is a striking phenomenon in all countries, and to a great extent governs the range of the species. Obviously, if the foodplant of a monophagous species is confined to one biotope or one locality, the species must inevitably be similarly restricted, as regards breeding (e.g. *Marumba quercus*, No. 150, monophagous on oak, is restricted to the woodland zone of the mountains.) In nearly every such case, however, experiment would probably prove that even were the foodplant provided other conditions in the plains would prevent the survival there of the species, for there are polyphagous and monophagous species, similarly restricted, whose foodplant is found in both regions. There are presumably internal (physiological) reasons besides diet-preferences responsible for the inadaptability of the insects restricted to one only of the two main biotopes. The desert climate of the plains, with the longer summer, greater heat, strong winds, and scanty humus, permit fewer species to live there than conditions in the mountains, as the figures on p. 10 show. Even the oases of the plain are only slightly richer in species than the desert and far less rich than the mountains. Greater specialisation therefore characterises species adapted to live in deserts.

In the desert, as elsewhere, two classes of lepidoptera may be found:

- (1) Residents (which tend to breed near where they originated), and
- (2) Migrants (which make long journeys every year and often breed far from where they started).

It is most important to know into which class an insect pest falls, before planning a campaign. The migrants avoid the climatic extremes of the desert by their mobility and the next generation may feed up hundreds of miles away from their parents' breeding-place. In general they inhabit the desert and the plains during the cooler months and tend to feed on ephemeral and rather varied annual vegetation. They seldom bury deep in the soil. They are multivoltine, and grow up quickly.

The residents avoid the unfavourable climatic extremes by a highly developed diapause. They inhabit the desert all the year round but in many cases are only active for a few months each year, being dormant for the rest. They frequently bury deep in the soil (nine inches is quite normal) and are mostly univoltine or bivoltine, as far as the knowledge of their early stages permits one to judge. (We are still unfortunately ignorant of the biology of many species of the lepidoptera of the Middle East.) Like the migrants, their larval stage if not subterranean, generally coincides with the cool moist winter season and early spring, in the south and the warmer period of spring and early summer before desiccation sets in, further north.

The oases of the plain are, thanks to their humidity, less unfavourable. Some lepidoptera, widespread in the mountains but unable to live in the desert, are able to inhabit these oases. These species are usually Euro-oriental or Euro-Siberian species, more or less ubiquitous in more temperate climates. A minority however are Tropical species, more or less ubiquitous in more humid Tropical regions.

Some of the univoltine or bivoltine desert lepidoptera appear during their short flying season in very large numbers. Deserts thus may have fewer resident species, but very great numbers of individuals. Midsummer only appears to depopulate the desert, as winter in colder regions; for the population of residents survives the summer, dormant and concealed, usually below the surface of the soil.

As a rule, univoltine and bivoltine species with a prolonged diapause never migrate; and migrants cannot, as a whole, perform long diapauses. Exceptions to the latter rule are individual cases; cases where the greater part of a brood of a migrant species remains dormant for months are unknown.

Thus univoltine and bivoltine species are mostly harmless, or if harmful to agriculture, not severely so. The multivoltine migrants, on the other hand, can build up a population in geometrical proportion by their successive broods in a year, can evade predators by emigration to fresh habitats, and can reinforce and swell indigenous pest-populations with immigrant swarms.

DISTRIBUTIONAL ANALYSIS OF THE FAUNA

In the following table, column "A" contains the number of species found only in Biotope A, the mountains; column "B", those found only in Biotope B, the plains; and column "C", those found in both.

Name and total species.	A	B	C
Papilionoidea (114)	83	8	23
Hesperioidea (19)	11	3	5
Bombycoidea (28)	14	5	9
Phalaenoidea (324)	171	62	91
Anthroceroidea (6)	6	—	—
Geometroidea (102)	69	15	18
Pyraloidea (208)	80	88	40
Gelechioidea (50)	17	27	6
Tinaeoidea (54)	32	17	5
Incurvarioidea (1)	1	—	—
—	—	—	—
906	486	225	195
—	—	—	—

The salient features of comparative distribution revealed may be summarised as follows. Though the area of the plain is about twelve times greater than that of the mountains it has a much poorer fauna as regards the number of species; moreover, this fauna is to a great extent different. Some groups, however, are better than others at adapting themselves to, and flourishing in, the more desertic conditions of the plain, the *Pyraloidea* and *Gelechioidea* being outstanding examples of such ability. The complete inability of the *Anthroceroidea* (*Zygaenoidea*) to colonise the plain is also noteworthy.

EXPLANATION OF ZOOGEOGRAPHICAL TERMS

In explaining geographical terms it is first necessary to distinguish between the ranges of animals and the centres of distribution.

Species can be classified into range-categories, such as Palaearctic, Palaco-tropical, Euro-Siberian, etc., on the basis of their present distribution. This is a classification of present fact.

They can also be classified into origin-categories, such as Anatolian-Iranian, etc., on the basis of their "centre of dispersion", a theoretical notion arrived at by a critical consideration of many facts of distribution and taxonomy. This is a classification of past history.

This list attempts, in the cases of the better known lepidoptera, to give both classifications. But owing to inadequate knowledge, the Pyralids and Micro-lepidoptera are not classified geographically.

In explaining the geographical terms, two columns are used, the first defining the terms of range-category, the second the terms of origins. Only those categories represented in Iraq are here defined; e.g. the Nearctic is excluded.

Range categories.

HOLARCTIC: inhabiting the North Temperate Zone of both New and Old World.

PALAEARCTIC: inhabiting the Old World North Temperate Zone.

Euro-Siberian: Inhabiting the Cool Temperate Zone of the Palaeartic Region, usually from the European shores of the Atlantic to the Asiatic shores of the Pacific Ocean.

Euroriental: inhabiting the Warm Temperate latitudes of the western half of the Palaeartic Region; the south-eastern boundary is the monsoon frontier, from the Indus valley north-eastwards.

Anatolian-Iranian: inhabiting all or part of the Balkans, Turkey, Lebanon, Syria, Palestine, Iraq, Armenia, Transcaucasia, Persia (Iran), Afghanistan, and West Turkestan.

Iranian-Mauretanian: inhabiting the Anatolian-Iranian area and also N.W. Africa. (A small but interesting category, typified by the *Pistacia atlantica* and *mutica* trees.)

Mediterranean: inhabiting the shores of the Mediterranean Sea; *East Mediterranean* are those not found west of the Balkans. (They occasionally reach Iraq.)

Pan-Eremic: Inhabiting the deserts and steppes of the Old World from the Atlantic shores of N. Africa to Central Asia.

Remarks about their origin.

In many cases Holarctic species are of Palaeartic origin.

The Palaeartic Region contains several centres of dispersion.

Euro-Siberian species are of Asiatic origin, the centre being in East Central Asia.

Euroriental species are of Asiatic origin, the centre being *Anatolian-Iranian*.

Anatolian-Iranian species are autochthonous on their own territories, though the area has five sub-centres: *Armenia*, the *Elburz* range, the *East Mediterranean*, *Jordania*, and *Fars*. (Iraq links the first and last of these.)

Iranian-Mauretanian species are of *Anatolian-Iranian* origin (*Fars* sub-centre).

East Mediterranean and in fact most Mediterranean (other than purely West Mediterranean species which have an *Atlantic - Mediterranean* origin) are of Asiatic origin but belong to the *East Mediterranean* sub-centre of the *Anatolian-Iranian* centre.

Pan-Eremic species are mostly of Asiatic origin and may be considered *Anatolian-Iranian* desert-specialists.

Range categories.

Saharan-Sindian: inhabiting the deserts of the Old World from the Atlantic shores of N. Africa to S. Persia or the Indus valley.

Eastern Eremic: inhabiting the Old World deserts eastward from the Nile valley.

(N.B.—Many of the species with the above three Eremic ranges extend somewhat south of the Tropic of Cancer in Arabia and Africa.)

HOLO-TROPICAL: inhabiting the Tropical Zone of both New and Old Worlds.

PALAEO-TROPICAL: inhabiting the Tropical Zone of Asia and Africa.

Asiatic Tropical (or Indo-Malayan): inhabiting the Tropical zone of Asia.

(N.B.—Some Tropical species cross the Tropic of Cancer, and penetrate the North Sub-tropics in which Iraq is situated.)

Remarks about their origin.

Many Saharan-Sindian species and all Eastern Eremic species are of Asiatic origin and may be considered *Anatolian-Iranian* desert-specialists, thus including Arabia in the Anatolian-Iranian centre. The *Red Sea* basin and *South Persia* are two Eremic sub-centres, attached respectively to the *Jordanian* and *Fars* sub-centres.

Most holo-tropical species are domestics or migrants; most are probably of Old World origin.

Whether the centre of Palaeo-tropical species is Asian or African, and whether that of Asiatic Tropical species is Malayan, Indian or Arabian, will not be discussed here, as these problems are remote from Iraq.

Iraq is well situated for the study of the difficult problems of the Middle East zoogeography, being in the centre of the Anatolian-Iranian centre of distribution and containing great diversity of biotope. It becomes apparent that by giving a historical status to the Eremic range-categories one renders very difficult the classification of many Iraqi Lepidoptera; the above scheme simplifies it.

The above geographical categories are distributed in Iraq, as between the main biotopes, as follows (the three columns have the same connotation as a few pages before):

WORLD-WIDE OR VERY WIDESPREAD:					A	B	C	Total
Phalaenoidea	..	..	..	..	—	—	2	2
Tinaeoidea	..	..	..	..	—	—	1	1
Other groups	..	..	..	..	—	—	—	—
					—	—	3	3
PALAEARCTIC AND HOLARCTIC:								
Papilionoidea	..	..	..	..	82	3	18	103
Hesperioidea	..	..	..	..	13	—	3	16
Bombycoidea	..	..	..	..	14	2	5	21
Phalaenoidea	..	..	..	..	171	48	79	298
Anthroceroidea	..	..	..	..	6	—	—	6
Geometroidea	..	..	..	..	69	11	16	96
Aegeriidae	..	..	..	..	2	—	1	3
Cossidae	..	..	..	..	8	4	2	14
					365	68	124	557

TROPICAL:

Papilionoidea	1	5	5	11
Hesperioidea	—	3	—	3
Bombycoidea	—	3	4	7
Phalaenoidea	—	14	10	24
Geometroidea	—	4	2	6
Anthroceroidea	—	—	—	—
Aegeriidae	—	—	—	—
Cossidae	—	—	—	—
	1	29	21	51

Total "Macro-lepidoptera":¹ 611

¹ The "micro-lepidoptera" families are omitted above and below because inadequate knowledge of their world distribution, renders it impossible to classify them all geographically with probability.

It is evident from the above figures that the Palaearctic element of the lepidopterous fauna of Iraq predominates over the Tropical outstandingly. Even in the plain where the Tropical species are more numerous they are far outnumbered by the Palaearctic.

The distribution in Iraq of the various geographical components of the Palaearctic element, as between the main biotopes, is:

EURO-SIBERIAN (including Holarctic):	A	B	C	Total
Papilionoidea	12	—	4	16
Hesperioidea	3	—	1	4
Bombycoidea	2	—	—	2
Phalaenoidea	33	—	16	49
Geometroidea	3	—	—	3
Anthroceroidea	—	—	—	—
Aegeriidae	—	—	—	—
Cossidae	2	—	—	2
	55	—	21	76

ANATOLIAN-IRANIAN:

(i) with restricted Anatolian-Iranian range.

Papilionoidea	34	—	3	37
Hesperioidea	1	—	1	2
Bombycoidea	8	1	2	11
Phalaenoidea	91	5	30	126
Geometroidea	38	—	9	47
Anthroceroidea	5	—	—	5
Aegeriidae	2	—	1	3
Cossidae	5	—	—	5
	184	6	46	236

(ii) with Euroriental, Iranian-Mauretanian, or Mediterranean range.

Papilionoidea	..	..	..	..	36	—	8	44
Hesperioidea	..	..	..	..	7	—	3	10
Bombycoidea	..	..	..	..	4	—	2	6
Phalaenoidea	..	..	..	..	47	—	19	66
Anthroceroidea	..	..	..	..	1	—	—	1
Geometroidea	..	..	..	..	28	—	5	33
Aegeriidae	..	..	..	..	—	—	—	—
Cossidae	..	..	..	..	1	—	—	1
					124	—	37	161

(iii) with Pan-Eremic, Eastern Eremic or Saharan-Sindian range.

Papilionoidea	..	..	..	..	—	3	3	6
Hesperioidea	..	..	..	..	—	—	—	—
Bombycoidea	..	..	..	..	—	1	1	2
Phalaenoidea	..	..	..	..	—	43	14	57
Anthroceroidea	..	..	..	..	—	—	—	—
Geometroidea	..	..	..	..	—	11	2	13
Aegeriidae	..	..	..	..	—	—	—	—
Cossidae	..	..	..	..	—	4	2	6
					—	62	22	84
Total Anatolian-Iranian	..	..	..	..	308	68	105	481

The endemics, or species not yet known from outside Iraq, are placed above as Anatolian-Iranian-Eremic, or as restricted Anatolian-Iranian species, according to the biotope in Iraq which they inhabit.

These figures show clearly how the Anatolian-Iranian component predominates in Iraq; its Eremic specialists are concentrated in the plain, its more mesophilous species in the mountains. Many of the former penetrate as far as Middle Heights of the mountains on the drier ground; and some of latter penetrate into the plain, as we have already remarked, in oases, or, in some cases, in the northern part and foot-hills only, accompanied by a smaller number of Euro-Siberian species.

It will be seen that the Eremic species have been treated above as Anatolian-Iranian species in origin that have in the long course of evolution become desert-specialists. Actually a group of "peak-specialists" might also be distinguished from the majority of the Anatolian-Iranian mountain-dwellers; in some ways the **Upper Heights** are as distinct a biotope as the plains with their own specialists; but the separation has not been made here, because of the shortness of the distances and the difficulty without longer study, of being sure to which group many species, taken on the border-line, rightly belong.

The woodland-zone species form the most numerous single ecofauna in Iraq and are composed, as has been shown, of a group of restricted Anatolian-Iranian range and of

an equally large group of wider range; the latter is in turn composed mostly of Eurorientals and also of not a few Euro-Siberians. The proportions of each category, however, differ according to the foodplants, and these differences are worth pointing out as they must have a historical significance.

The Euroriental range is more frequent in the monophagous fauna of the oak (*Quercus*) than in the faunas attached to the *Rosaceae* or *Pistacia*, as the following analysis shows:

Quercus

Widespread group: 15 Euroriental species; viz. (29) *Z. quercus*, (30) *T. ilicis*, (150) *M. quercus*, (195) *S. argentina*, (196) *P. bucephaloides*, (167) *R. strigula*, (169) *R. togatulalis*, (311) *D. protea*, (350) *D. oo*, (315) *X. croceago*, (441) *E. diversa*, (442) *E. nymphaea*, (463) *C. alchymista*, (494) *D. binaria*, and (526) *C. ruficiliaria*; and 2 Euro-Siberians; viz. (193) *H. milhauseri* and (194) *N. anceps*.

Restricted group: 1 Anatolian-Iranian species: (139) *E. philippsi*.

Rosaceae (Prunus, Crataegus, Pyrus, Amygdalus)

Widespread group: 4 Euroriental species, viz. (3) *I. podalirius*, (7) *A. crataegi*, (31) *M. abdominalis*, and (146) *C. glaucata*.

Restricted group: 11 Anatolian-Iranian species, viz. (32) *N. marcidus*, (138) *E. amygdali*, (183) *L. destituta*, (184) *L. lapidicola*, (309) *Allophyes* sp., (497) *G. palumba*, (558) *B. mimetes*, (559) *E. bahmana*, (560) *E. ghirshmani*, (575) *N. variabilis*, and (576) *N. rayatica*.

Pistacia

Widespread group: 1 Iranian-Mauretania species: (417) *E. aduatrix*.

Restricted group: 5 Anatolian-Iranian species, viz. (185) *O. terebynthina*, (189) *T. solitaria*, (418) *E. adoratrix*, (443) *M. bimaculata*, and (538) *O. externata*.

Other foodplant-faunas could also be analysed similarly but there is no room for an exhaustive treatment of all; it is enough to give the above characteristic examples and to mention that the fauna of the tamarisks of Iraq and Egypt were discussed in Wiltshire (1949, ii) and of the poplars of the Middle East in the same work and also in Wiltshire (1951). The *Zizyphus*-feeders, it may be added, e.g. the genus *Tarucus* (42 and 43) and *P. lahaye* (498), are, at least in part, of Tropical origin.

Such are the facts of present distribution and ecology of the Iraq lepidoptera; and taken together with the geological data they permit some tentative reconstructions of the faunistic history.

PROBABLE HISTORY OF THE IRAQI FAUNA

The Anatolian-Iranian Fauna is at its richest in the woodland zone; it seems to be an autochthonous Tertiary (probably Pontian) fauna which has survived a succession of climatic fluctuations at Middle Heights and on the foot-hills of the Taurus, Lebanon, Anti-Lebanon and Zagros mountains, in an arc round what geographers often now call "The Fertile Crescent".

The contrasts between the ranges of the oak-fauna, the *Rosaceae*-fauna, and the *Pistacia*-fauna, to which attention has been drawn above, explain themselves if the distribution of the trees is considered.

The *Pistacia* and various *Rosaceae* become dominant further south along the Zagros range, attaining their greatest climax and breadth in Fars, S.W. Iran, but also extending in a narrower and less continuous band eastwards, south of Kerman and the Lut and north again in Eastern Iran. In Iraq and S.E. Turkey, however, *Quercus infectoria* and *Quercus aegilops* dominate the woodland zone. It appears that heavier rainfall permits the dominance of the oak, and that *Pistacia* stands are characteristic of a transitional, more southerly zone between the oak woods and the Saharan-Sindian deserts. During the Pleistocene glaciations and probably at other periods in the geological past, the rainfall in the Mediterranean and the Middle East was heavier than now, and in the N.E. Mediterranean, which constitutes the sole land-link between the Anatolian-Iranian woods and those of Europe and the Western Mediterranean, the dominance of oak over other kinds of tree and shrub was accentuated so that *Pistacia* was excluded and the *Rosaceae* were only able to flourish on the fringes of the forest. Their dependent insects, especially the weaker fliers, were unable to extend so freely from east to west as the oak-feeders and became isolated here and there. It is necessary however to assume that while this was the state of affairs in the N.E. Mediterranean, in the S.E. Mediterranean, i.e. along the N.E. African shores, the climate continued to be too arid to permit an interchange with the forests of N.W. Africa. Otherwise it is difficult to explain why only one species of *Pistacia*-feeder is common to N.W. Africa and the Anatolian-Iranian region, despite the close affinity of *Pistacia atlantica* and *mutica*.

The gradual thinning and partial disappearance, in N. Iraq, of this thick woodland due to recent climatic trends and centuries of human interference, has enabled the faunas of the smaller shrubs, herbs, and grasses, to expand their range during the past ten thousand years. Some desert species were also able, for these reasons, to penetrate Middle Heights, and doubtless some of the Upper Height species did so from the upper limit of the woodland as the trees were thinned.

However, since the glaciers on the Upper Heights have been retreating during the past twenty thousand years, most of the upper height specialists, being less adaptable, have taken refuge on shrinking habitats at ever greater heights, after having a wider distribution at lower altitudes during the Pleistocene glaciations. In the plain and at Middle Heights these twenty-thousand years have witnessed a gradual desiccation both in Iraq and throughout the Middle East and North Africa and the Mediterranean basin, enabling the desert-specialists greatly to expand their range. The westward expansion of these Anatolian-Iranian Eremics has, in most cases, been more recent than that of the Anatolian-Iranian Eurorientals of the woodland zone, as the conditions favouring the latter provided barriers to the former.

Some of the Eremics however are also found in Central Asia, and these may well have originated there; or, if they originated nearer Iraq, may well have expanded eastwards into Central Asia at an early date during the Tertiary, before the maximum uplift of the Zagros and Elburz ranges.

Some Eremic species, inhabiting both the eastern foot-hills and the western (or Syrian) desert, show racial differences, e.g. (22) *charlonia* and (23) *eupheme*. Probably these differences are the result of isolation, first by an arm of the sea and, later, by the alluvial, unfavourable, terrain replacing the sea. The sea was an extension of the head-waters of the Persian Gulf and covered the sump of the Mesopotamian basin; it was, moreover, the remnant of a much wider early Tertiary (Miocene) sea which was narrowed by mid-

Tertiary earth movements and mountain-building. The Eremic species mentioned, and probably most other Eremic species showing no such racial differences, appear therefore already in mid-Tertiary (i.e. not later than Pliocene) times to have evolved into species that have changed little, if at all, since then, and inhabited then the east and west shores of this sea; they may well have speciated by desert-specialisation in the Syrian desert or the Zagros foot-hills from Pontian ancestors derived from older faunas.

Although treated here as a branch of the Anatolian-Iranian fauna, the Eremics are thus evidently of considerable antiquity.

The few peak-specialists that have a wide range (Euroriental or Euro-Siberian) may have been able to expand at a lower altitude during the Pleistocene glaciations. But in one remarkable case, (15) *callidice*, where the range appears to be Holarctic, the expansion must have taken place at a much earlier period, and doubtless there are a few other such species, of antiquity equal to the Eremics.

While the three Anatolian-Iranian categories are virtually autochthonous in Iraq or its close neighbours, the presence of Euro-Siberian and Tropical species is due to an invasion from elsewhere. Only the more adaptable of these categories have succeeded in establishing themselves in Iraq, and mostly remain very local; they are probably in retreat after a stronger invasion, facilitated by a more humid period. Most of the southern and central plain was under the sea in Pliocene times and the alluvial parts were probably submerged in Pleistocene times and even later to some extent. The Asiatic Tropicals, therefore, must have arrived, in S. Iraq, via South Persia subsequently to the drying up of these parts; but the more widespread Palaeo-Tropicals, such as the *Tarucus*, probably entered the Middle East earlier than that, perhaps in the Pontian. As for the Euro-Siberians, these may have spread from Central and East Asia into N. Iraq soon after it emerged from the sea in the Middle Tertiary, or more probably arrived in the late Tertiary or later still.

The above conclusions do not apply with the same probability to migrants, whose date of arrival in Iraq it is impossible to postulate owing to their mobility and greater independence from particular vegetation-associations. They are constantly leaving and re-entering the territory. Many of them, however, are doubtless of Anatolian-Iranian origin.

The pests of cultivated crops have a history probably similar to that of the migrants. Some were originally attached to local vegetation and have adapted themselves to cultivated relatives of their first foodplant (e.g. the fig-tree pest (187) *amanda*). Others because of their great migratory capacity may be quite recent arrivals.

It is interesting that certain *Ephestia* (e.g. No. 594) are now cosmopolitan pests on a variety of stored food-products and, over a great part of their range, are only found indoors, but in South Iraq are found out of doors feeding on fallen dates in palm gardens. This may indicate that these species are autochthonous and originated in the wild date-groves of the Eremic part of the Middle East. Date-cultivation in Iraq is as old as human history, and these species probably first entered into human habitations in Sumerian times; they thus gradually attached themselves to man and his buildings and so eventually spread over the world.

In other cases of house-dwelling cosmopolitan pests, e.g. (884) *T. fuscipunctella*, there is no reason to suppose they originated in or near Iraq rather than anywhere else. *T. abruptella* (879), on the other hand, though its close relative attacks carpets, clothes

and furs over a world-wide range, appears to be an Anatolian-Iranian species that has not yet adapted itself to prey on human products and so to spread from its centre.

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All these and others unnamed have contributed to this list in their various ways; such a work can never be a one-man job.

ADDENDUM

* **1a. *Papilio demoleus* L.**

THE LIME BUTTERFLY.

The first and only known Iraqi example was taken at Hillah (Central Plain) on 28 October, 1956. The butterfly is a migrant but may establish itself in oases of the plain, being resident in S. Iran and E. Arabia.

Foodplant: *Citrus* foliage. Multivoltine.

Asiatic Tropical.

LIST

Sub-Order: DITRYZIA
Super-family: PAPILIONOIDEA
Family: PAPILIONIDAE

* 1. *Papilio machaon* L. ssp. *centralis* Stgr.

THE SWALLOW-TAIL BUTTERFLY. (Pl. III, Figs. 1-5.)

This butterfly occurs all over the mountains; but in the plain it has not been recorded south of Kut el Amarah.

The foodplants on which it depends are certain kinds of *Umbelliferae* and *Rutaceae*. In Central Iraq it is an oasis insect dependent on cultivation; the principal foodplant is rue (Ar. *Sdhab*) (*Ruta graveolens* L.). The larva is found more rarely on dill (Arab. *Sbint*) (*Anethum graveolens*) and lime-tree or orange foliage (*Citrus*). In the Middle Dyala it depends on a group of wild foodplants some of which grow on the foot-hills, others along the canal-banks.

There appear to be five emergences annually at Bagdad but there are probably only three or four generations since the third generation adult may emerge before midsummer or in September after aestivation; similarly the final generation is partial, some pupae hatching in November, others over-wintering. Diapause is usually performed by the pupa but occasionally by the full-grown larva. After a normally cold winter the butterfly appears on the wing in March; it disappears between mid-July and mid-September and again between mid-November and March. The caterpillars have been seen in all months, except February and August, in Bagdad gardens. The egg hatches after about a week. The larvae reach full-growth in thirty days in favourable circumstances. They are normally green banded with black and spotted with orange, but in the winter usually become black-suffused (Pl. III, Figs. 4, 5) and in the summer tend to appear whitish with reduced black markings (Pl. III, Fig. 3). In the winter they pupate in sunny exposed places, e.g. high on tree-trunks; in the summer they hide among foliage to pupate. Pupae on tree-trunks are brown or grey; those among foliage are green. The winter larvae and pupae seem immune to predation but the summer ones have various enemies and suffer heavy losses. The first generation of the adult has more, the summer adults less, black pigmentation (Pl. III, Figs. 1, 2).

The range outside Iraq is Holarctic.

2. *Papilio alexanor* Esp. ssp.

THE TIGER SWALLOW-TAIL.

This butterfly is confined to the high mountains. Its foodplants are certain *Umbelliferae* growing above the tree-line. There is only one generation, flying in June. It is a Eurooriental mountain butterfly of Anatolian-Iranian origin.

* 3. *Iphiclides podalirius* L. ssp. *persica* Verity.

THE PEAR-TREE SWALLOW-TAIL.

This butterfly only inhabits the mountains in Iraq and has only been seen between 4000 and 6000 ft. above the sea.

Its foodplant has not been observed in Iraq, but elsewhere the larva is found on wild pear (*Pyrus*), almond (*Amygdalus*) and related trees.

There are probably three successive generations in Iraq. Peile (1921) wrongly thought that its absence from the plain of Iraq was due to the absence there of its foodplant. He overlooked the fact that in the oases of the plain some fruit-trees are cultivated which provide possible food. The real cause for its absence is doubtless the inability of the butterfly to survive in the climate of the plains.

This Eurooriental butterfly is more northerly in range than the preceding. Probably of Anatolian-Iranian origin.

4. *Zerynthia cerisyi* Hübn. ssp. *deyrollei* Ob.

THE SPRING SWALLOW-TAIL.

This butterfly thrives at 2000–3000 ft., and also at 5000–6000 ft. It is also known from the northern plains, but not south of Tekrit.

Its foodplant is *Aristolochia*. There is one generation, flying in April and early May on bare hills and steppe plains, and in June at Upper Heights, where the form is closer to the typical.

Anatolian-Iranian.

5. *Doritis apollinus* Hbst. ssp. *apollinaris* Stgr.

THE APOLLINUS BUTTERFLY.

This butterfly, like the last, inhabits mountains and is also recorded from the northern plains, e.g. near Mosul.

Its foodplant is also *Aristolochia* and it flies in April, having only one generation. Its habitat and range are similar.

6. *Parnassius mnemosyne* L. ssp. *nubilosus* Chr.

THE CLOUDED PARNASSIUS.

This butterfly is found at upper heights in the mountains.

Its foodplant in the Middle East has not been recorded; in Europe it feeds on *Corydalis*. Several species of this genus of herb are known from the high mountains of Iraq. There is one generation, flying in June–July. Eurooriental, probably of Anatolian-Iranian origin.

Family: PIERIDAE

6a. *Leptidea lathyri* Dup. (= *duponcheli* Stgr.) ssp. *lorkovici* Pfeiffer (1932).

Inhabits the mountains near the upper tree limit.

Probably bivoltine; it has been taken at over 5000 ft. in early June. Foodplant: vetches. Anatolian-Iranian, with Eurooriental range.

*** 7. *Aporia crataegi* L. ssp.**

THE BLACK-VEINED WHITE.

Quite common at middle heights in the mountains.

In Iraq its larvae feed principally on wild *Prunus* and *Pyrus* bushes; they may also feed on *Crataegus* and possibly even cultivated fruit trees. There is one generation, the butterfly flying in May–June. The gregarious small larvae hibernate in a web on the foodplant.

Euro-Siberian.

8. *Pieris ergane* Hübn.

THE MOUNTAIN WHITE.

Flies at Haj Omran and doubtless other upper height localities in the mountains. There are three or four generations each year.

Anatolian-Iranian.

**** 9. *Pieris rapae* L. ssp. *iranica* LeCerf. (Pl. III, Figs. 8 and 9).**

THE SMALL WHITE.

This is one of Iraq's commonest butterflies, occurring from the highest mountain-peaks in the north to the Shatt al Arab oasis in the south. It is not however a true desert insect in Central and Southern Iraq, though its migratory habits might lead to its being found there temporarily. Its foodplants are various *Cruciferae*, *Nasturtium* and *Reseda*, and it can damage cabbage crops. It has successive broods, and in the plain is seen all the year round, being often very numerous in June and November.

Outside Iraq its range is Holarctic. Probably of Euro-Siberian origin.

10. *Pieris napi* L. ssp. *pseudorapae* Verity.

THE GREEN-VEINED WHITE.

Inhabits the mountains.

Foodplant: various *Cruciferae*. There are three or four successive generations.

Euro-Siberian.

**** 11. *Pieris brassicae* L.**

THE LARGE WHITE.

In Europe this butterfly is a pest on cabbages but in Iraq it is confined to the mountains.

It feeds on various *Cruciferae* and in Cyprus I have seen it feeding on caper (*Capparis spinosa*). It has three or four generations annually.

Further north it migrates in swarms but such movements have not yet been observed in Iraq.

Euroriental, probably of Anatolian-Iranian origin.

12. *Pontia daplidice* L. (Pl. V, Fig. 8).

THE BATH WHITE.

Common in the mountains and the plain.

It feeds on various *Cruciferae* and appears in successive generations through the year. In the plain it inhabits oases all the year round, but in the desert is principally seen in the spring and early summer. In the mountains it flies from spring to autumn.

Anatolian-Iranian, with Euroriental range.

13. *Pontia glauconome* Klug ssp. *iranica* Bien. (Pl. V, Fig. 7).

THE DESERT WHITE.

Probably widespread in the desert but only known so far from the foot-hill region around the Dyala.

In Egypt its foodplant is the spiny desert Crucifer *Zilla*, but in Iraq is unknown. Its phenology is similar to that of the preceding.

Anatolian-Iranian, Eremic.

14. *Glycestha aurota* F. (= *mesentina* Cram.).

THE CAPER WHITE.

This butterfly might be met with anywhere in Iraq except the highest mountains; it is a migrant and rather erratic in appearance.

It feeds on *Capparis*. Its larvae have only been found in Iraq and Iran in November. The butterfly itself is most often seen in the plains and foot-hills in the autumn and again in the spring, having apparently hibernated there; in the summer it may penetrate into Middle Heights.

It is a tropical, migratory butterfly, of India and Africa.

15. *Synchlœ callidice* Esp. ssp. *chrysidice* H.-S.

THE PEAK WHITE.

Has been found commonly in the mountains at 10,000 ft. and higher.

There is one generation flying in July–August.

According to Higgins (1953) this species is Holarctic. In the Old World its range is Euroriental montane.

16. *Euchlœ chloridice* Hübn. (Pl. V, Fig. 9).

HÜBNER'S MOUNTAIN WHITE.

Peile recorded a single specimen from Khaniqin (desert foot-hills); but I have seen the butterfly frequently at greater heights in Iran and suppose that it could be found similarly in Kurdistan. In S.E. Turkey, Pfeiffer found it at moderate heights, but scarce. There are three generations annually.

Anatolian-Iranian, with Euroriental range.

17. *Euchlœ belemia* Esp.

THE GREEN-STRIPED WHITE.

Widespread in the plains of Iraq but commonest on the stony desert and foot-hills. Doubtless it also penetrates Middle Heights.

It feeds on *Hirschfeldia adpressa*, *Sinapis alba* and probably other wild *Cruciferae*.

It has two vernal generations, the first flying from January to March, the second from March to April.

Eremic, of Anatolian-Iranian origin.

18. *Euchlœ ausonia* Hübn. ssp. *persica* Verity.

THE GREEN-DAPPLED WHITE.

Chiefly occurring in foot-hills and stony desert this butterfly probably also penetrates the Middle Heights.

It feeds on *Brassica tournefortii* and *Sinapis arvensis* and probably other wild *Cruciferae*.

There are two generations annually, the first flying in March–April, the second in May–June.

Euroriental, of Anatolian-Iranian origin.

19. *Anthocharis gruneri* H.-S. ssp. *armeniaca* Christ. (Pl. II, Fig. 1).

THE EASTERN ORANGE-TIP.

Flies at Shaqlawa and doubtless other Middle Height localities in April. The white colouring of this subspecies make it impossible to distinguish on the wing from the following

species, but once taken its subtly different markings will distinguish it. The form is much the same as that of Northern Iran, but smaller than forms from the Southern Zagros (S.W. Iran). The form *eros* Roerber occurs together in all these places with typical *armeniaca*; it is merely an aberration lacking the dark inner border to the orange tip of the forewing.

A univoltine, Anatolian-Iranian species.

20. *Anthocharis cardamines* L. ssp. *phoenissa* Stgr. (Pl. II, Fig. 2).

THE ORANGE-TIP.

This is commoner at Shaqlawa and Rowanduz Gorge, i.e. Middle Heights in Northern Iraq, than the preceding.

Its foodplants elsewhere are *Cardamine*, *Turritis*, *Barbarea*, and *Nasturtium* but have not been recorded in Iraq. It is univoltine, flying in one vernal generation.

The species is Euroriental in range and Northern Iraq seems to be the easternmost limit of the Mediterranean race. Its origin is doubtful.

21. *Anthocharis damone* Boisd. ssp.

THE YELLOW ORANGE-TIP.

Inhabits the Amadia district. It is univoltine, flying in May. Northern Iraq seems to be the easternmost limit of this Mediterranean species, which is known to feed elsewhere on wild *Cruciferae*.

Mediterranean, of East Mediterranean origin.

22. *Anthocharis charlonia* Donz. (Pl. II, Figs. 4, 5).

THE GREENISH BLACK-TIP.

The headquarters of this butterfly in Iraq are desert foot-hills. In Syria and Persia it also inhabits high mountains so perhaps this is the case in Iraq too but it has not yet been noted higher than 1000 ft.

It has two vernal generations, the first usually about February, the second March–April. Foodplant: wild *Cruciferae*.

Two races occur in Iraq, the yellow ssp.: *mesopotamica* Stgr. (Fig. 5) and the whitish *transcaspica* Stgr. (Fig. 4). The former flies at the ruins of Ukhaider near Kerbela, and probably elsewhere in western and northern Iraq; the latter inhabits the eastern foot-hills, e.g. in the Dyala province.

Since in the Elburz range in N. Persia both yellow and whitish forms occur together, there may be places in Iraq where the same occurs.

This Pan-Eremic butterfly, Anatolian-Iranian in origin, ranges from the Atlantic shores of the Sahara, through Arabia to Central Asia.

23. *Zegris eupheme* Esp. (Pl. II, Figs. 7, 8).

THE DESERT ORANGE-TIP.

Inhabits stony-desert and foot-hills.

Univoltine, flying in February–March–April. It feeds on *Sinapis*, *Raphanus*, and probably other *Cruciferae*.

Two races occur in Iraq: ssp. *tigris* Riley (Fig. 8) which was described from the Fathah Gorge near Baiji, whence its range extends westwards; and ssp. *dyala* Riley (Fig. 7), described from the foot-hills of the Dyala province, and extending thence south-eastwards

along the Zagros foot-hills into Southern Persia. The former has a yellow, the latter a white-scaled, underside of the forewing apical area. It would be interesting to see whether intermediate forms occur on the Jebel Hamrin half way between the two places, e.g. Injana.

Pan-Eremic, like the preceding.

24. *Colotis fausta* Oliv. (Pl. II, Fig. 6).

THE SALMON CAPER BUTTERFLY.

This migratory butterfly is common throughout most of Iraq during the last seven months of most years, except that it never reaches great heights; it reaches about 6000 ft. in the autumn usually.

Its foodplant is *Capparis spinosa*; it is multivoltine. Probably the reappearance of this butterfly is due to immigration from S. Persia.

This Tropical butterfly has Asian headquarters and does not extend west of the Nile; it is characteristic of rather arid countries.

*** 25. *Colias croceus* Fourc.**

THE CLOUDED YELLOW.

This migratory butterfly is to be seen from spring to late autumn continuously in the mountains, but in the plain it is seldom if ever seen in August and September.

It is multivoltine and feeds chiefly on lucerne, and also on wild trefoils and clovers. While it may take toll of lucerne it does not render it unfit for fodder.

Euroriental, of Anatolian-Iranian origin.

26. *Colias aurorina* H. S. ssp. *libanotica* Led.

THE DAWN YELLOW.

Though so far only taken near Amadia this butterfly is doubtless found at upper heights elsewhere in Iraq.

It is an Anatolian-Iranian species.

27. *Gonepteryx farinosa* Zell.

THE POWDERED BRIMSTONE.

Inhabits the mountains, and appears in two or three annual generations, of which the last probably hibernates.

Foodplant: *Rhamnus*.

Anatolian-Iranian.

28. *Catopsilia florella* F.

THE AFRICAN MIGRANT BRIMSTONE.

This migrant does not reside in Iraq; in some years enters from the south, but has never been seen in large numbers. Has been taken in the desert foot-hills of Central Iraq in March-April. The foodplant, *Cassia*, is not known in Iraq.

A Palaeo-tropical species.

Family: LYCAENIDAE

29. *Zephyrus quercus* L. ssp. *longicauda* Riley.

THE PURPLE HAIRSTREAK.

An inhabitant of the Kurdish oak-woods, now restricted to places where good-sized trees survive.

It feeds on *Quercus*, and flies in one generation which is seen in July–August–September. It flies round tall oak trees and sometimes settles on leaves of lower branches.

A Euroriental butterfly ranging from Britain to S.W. Persia down the Zagros range, doubtless of Anatolian-Iranian origin.

30. *Thecla ilicis* Esp. ssp. *caudatula* Z.

THE BLACK OAK HAIRSTREAK.

This also inhabits the oak zone of Kurdistan but survives better than the preceding in places where the trees are cut down and there is low secondary growth.

It feeds on *Quercus* and flies in one generation in May–June–July.

An Euroriental species, here at its eastern limit.

31. *Nordmannia abdominalis* Gerh. ssp. *gerhardti* Riley.

GERHARDT'S HAIRSTREAK.

Inhabits the Kurdish scrub-woods.

It feeds on *Prunus*, *Amygdalus*, *Eleagnus*. The early stages were described and illustrated in Wiltshire (1943). Univoltine, flying in June–July.

Euroriental, of Anatolian-Iranian origin.

32. *Nordmannia marcidus* Riley (1921).

RILEY'S HAIRSTREAK.

Little is known of this butterfly, described from Karind (see Peile, 1921); its habits are doubtless like those of the preceding.

Only known from the Zagros mountains at present.

33. *Tomares callimachus* Ev.

THE VERNAL COPPER.

Occurs on rather dry slopes at Middle Heights in the mountains, flying in one generation in April.

Anatolian-Iranian.

34. *Apharitis maxima* Stgr.

THE GREATER LEOPARD BUTTERFLY.

Widespread in the mountains from about 2500 ft. to 10,000 ft.

Flies in one generation, in June–July–August. It is a strong flier and is most easily taken in the evening sunshine when it likes to settle on dry slopes and roads.

Anatolian-Iranian.

35. *Apharitis epargyros* Ev. ssp. *marginalis* Riley (1921).

EVERSMANN'S LEOPARD BUTTERFLY.

Inhabits Middle Heights and probably also Upper Heights of the mountains.

It seems to be univoltine, flying in July–August. Some of Riley's types were taken by the Kalisan stream near Sulaimania.

Anatolian-Iranian.

36. *Apharitis cilissa* Led.

THE LESSER LEOPARD BUTTERFLY.

Known from 5000 ft. near Rayat, and probably to be found at various heights in the mountains.

Univoltine, flying in June.

Anatolian-Iranian.

37. *Lycaena thetis* Klug ssp. *caudatus* Stgr.

THE FIERY COPPER.

Inhabits Upper Heights, frequenting mint-flowers along streams above the tree-line. Univoltine, flying in July–August.

Anatolian-Iranian.

38. *Lycaena tityrus* Poda (= *dorilis* Hufn.)

THE BLACKISH COPPER.

Occurs with the preceding, but is commoner.

Euroriental.

39. *Lycaena alciphron* Rott. ssp.

THE PURPLE-SHOT COPPER.

Has the same range and habitat in Iraq as the two preceding but flies earlier in the year; univoltine, in May–June.

Euroriental.

40. *Lycaena thersamon* Esp. ssp. *kurdistanica* Riley

THE LESSER FIERY COPPER.

Inhabits the mountains. Appears in three or four annual generations and flies from May to October. It feeds on *Rumex*.

Euroriental.

41. *Lycaena phlaeas* L.

THE SMALL COPPER.

In the plain, an oasis insect, but not known south of Bagdad. In the mountains, inhabits woods, gardens, plains and bare slopes up to about 9000 ft.

It feeds on *Rumex*, and is multivoltine; in the plain it may be taken from February to November.

Euro-Siberian.

42. *Tarucus balkanicus* Freyer subsp. *areshana* B.-B.

THE LITTLE TIGER BLUE.

Though recorded from the plain, my own opinion, based on an examination of the genitalia of my own specimens, is that this species is confined to the mountains of Iraq.

It feeds on *Paliurus spina-christi*, which is a common shrub at Middle Heights. In Cyprus I have found it feeding at sea-level on *Paliurus australis*. The only possible food-plant in the Central and Southern plains would be *Zizyphus spina-christi* (Arab. *Nebek*).

Multivoltine.

Palaeo-tropical.

43. *Tarucus rosacea* Aust. (= *mediterraneae* B.-B.)

THE MEDITERRANEAN TIGER-BLUE.

This is the commonest species of the genus in the plain, occurring with nebek trees (*Zizyphus spina-christi*), the foodplant, from the Shatt el Arab northwards to at least Bagdad. In this part of Iraq it is an oasis butterfly.

It is multivoltine, flying from February until the autumn. The coolest months are spent in the pupal stage.

Palaeo-tropical, with a rather strong Saharan-Sindian concentration.

(Whether the third Palaearctic species in this group, namely *theophrastus* F., really inhabits Iraq is doubtful; it has been recorded from the southern plain but the examinations which I have made of the genitalia of as many males as possible have not confirmed its presence.)

*** 44. *Cosmolyce boeticus* L.**

THE TAILED BLUE.

Probably Iraq's commonest butterfly, being found throughout the country. Though a migrant it is also resident.

It feeds on many kinds of leguminous plants, both cultivated and wild. In Bagdad it feeds principally on a leguminous creeper, and also on beans. In the plain it flies from February to December. Multivoltine.

Palaeo-tropical.

45. *Freyeria trochylus* Courv.

THE GRASS JEWEL.

This minute butterfly inhabits the desert foot-hills and also the Middle Heights of the mountains. It is multivoltine and doubtless flies from April to November, but has only been recorded so far in June.

Palaeo-tropical.

46. *Chilades galba* Led.

THE DESERT SMALL BLUE.

All over the plain, and up to Middle Heights in the mountains (e.g. Sulaimania, whence it has been recorded in September). It is both an oasis and desert insect.

The butterfly has successive generations, appears first in April and is commonest in midsummer. It feeds on and flies around *Prosopis stephaniana* (Arab. *shok*), and the larva is closely attended by the small ant *Monomorium gracillimum* Smith (see Peile, 1922, p. 261) which milks a sweet secretion from it.

An Eastern Eremic species, of doubtful origin.

47. *Zizeeria knysna* Trim. ssp. *karsandra* Moore.

THE SMALL MAUVE BLUE.

Widespread in the plains and in the mountains up to Middle Heights at least. It is not a desert insect, and favours roadsides, paths, lawns and gardens, though not exclusive to such.

It feeds on *Trifolium alexandrium* and doubtless other trefoils. It is multivoltine.

This is the Asiatic subspecies of a Palaeo-tropical species.

48. *Glaucopsyche cyllarus* Rott. ssp. *aeruginosa* Stgr.

THE GREEN BLACKSPOT BLUE.

Inhabits Middle Heights of the mountains. Flies in April–May; only one generation observed.

Euro-Siberian.

49. *Lycaenopsis argiolus* L. ssp. *hypoleuca* Koll.

THE HOLLY BLUE.

Inhabits Middle Heights and reaches above the tree-line to about 7000 ft.

Foodplant and phenology have not been recorded in Iraq. Probably bivoltine.

Holarctic.

50. *Philotes astabene* Hemm.

THE CHEQUERED BLUE.

This species, listed in the first edition as No. 85, *vikrama clara*, inhabits bushy ground at Middle Heights of the mountains.

Bivoltine, flying in spring and midsummer. Foodplant: *Thymus* and probably other herbs and bushes.

Anatolian-Iranian.

51. *Turanana panagaea* H.-S.

THE ODD-SPOT LITTLE BLUE

Upper Heights. Univoltine, flying in June–July.

Anatolian-Iranian.

52. *Plebejus pylaon* Fisch.-W. (= *sephyrus* Friv.)

THE ZEPHYR BLUE.

Inhabits Upper Heights, perhaps also Middle Heights. Univoltine, flying in June–July.

Anatolian-Iranian.

53. *Plebejus eurypilus* Freyer ssp. *iranica* Forst.

THE PERSIAN MOUNTAIN BLUE.

Inhabits Upper Heights; flies in one generation, in June–July.

Anatolian-Iranian.

54. *Aricia agestis* Schiff. (= *astrarche* Bgstr.)

THE BROWN ARGUS.

Inhabits desert foot-hills and mountains.

Feeds on *Erodium* and other low plants. Bivoltine, flying in early summer and autumn.

Euro-Siberian.

55. *Polyommatus icarus* L. ssp. *persica* Bien.

THE COMMON BLUE.

In desert foot-hills and the northern plains it is mostly restricted to the vicinity of watercourses; in mountains, where it is commoner, it is found at all altitudes. At Upper

Heights, above 9000 ft., where probably only one annual generation develops, a large race with blue-suffused females has been found.

Except at great heights the butterfly is bivoltine and the second brood lacks the under-side blue-green basal suffusion; the females are monotonous brown. The foodplants are trefoils and vetches.

Euro-Siberian.

56. *Polyommatus bellargus* Rott. ssp.

THE CLIFDEN OR ADONIS BLUE.

Inhabits Upper Heights only.

Univoltine, flying in July. Its foodplants elsewhere have been recorded as: *Coronilla montana*, *Stachys sylvatica*, *Trifolium*, *Genista*, *Hippocrepis*, etc.

Euroriental, of Anatolian-Iranian origin.

57. *Polyommatus mithridates* Stgr. ssp. *kovachi* Forst.

THE MITHRIDATES BLUE.

Probably widespread in the woodland zone, though only recorded so far from Shaqlawa, an oasis biotope at 2500 ft. in oak-wooded limestone mountains. Apparently univoltine, flying in July.

Anatolian-Iranian.

58. *Polyommatus iphigenia* H. S. ssp. *zeituna* Pfeif.

THE IPHIGENIA BLUE.

Inhabits Upper Heights, especially frequenting mountain streams. Univoltine, flying in July.

Anatolian-Iranian.

59. *Polyommatus loewii* Z. ssp. near *germaniciae* Pfeif.

LOEW'S BLUE.

So far only known from Middle Heights. In view, however of its occurrence in the deserts of Arabia and Egypt, it might well be taken eventually in the foot-hills and stony deserts of Iraq, especially in places where its foodplant is plentiful.

It feeds on thorny *Astragalus* bushes and is univoltine, flying in Iraq in June-July; at low altitudes it might be looked for in April-May.

Pan-Eremic, of Anatolian-Iranian origin.

60. *Polyommatus alcedo* Chr.

THE ALCEDO BLUE.

Inhabits Upper Heights, flying in June-July in one generation.

Anatolian-Iranian.

61. *Polyommatus anteros* Freyer.

FREYER'S BLUE.

Inhabits Upper Heights, and in the right spot, e.g. at 11,000-12,000 ft. on Mt. Algard, is very common. It is univoltine, and flies in July-August.

Anatolian-Iranian.

62. *Polyommatus ripartii* Freyer.

THE STREAKED BROWN.

Occurs commonly at about 4000–6000 ft. in the mountains, especially near streams.

Univoltine, flying in July–August.

Euroriental, of Anatolian-Iranian origin.

63. *Polyommatus damone* Ev. ssp. *wagneri* Forst.

THE DAMONE BLUE.

At great heights, 7000–9000 ft. in numbers. Univoltine, in July.

Anatolian-Iranian.

63a & 64. *Polyommatus carmon* H.-S. ssp. *cyanea* Stgr.***Polyommatus phyllis* Christ. ssp. *vanensis* Forst.**

THE CARMON AND PHYLLIS BLUES.

Both occur together with the preceding, and are Anatolian-Iranian.

65. *Polyommatus actis* H.-S. ssp. *pseudactis* Forst.

THE ACTIS BLUE.

At great heights in the mountains. Univoltine, flying in June–July.

Anatolian-Iranian.

66. *Meleageria daphnis* Schiff. (= *meleager* Esp.) ssp. *ignorata* Stgr.

THE MELEAGER BLUE.

Known from grassy places at 4000–6000 ft. in the mountains, and attracted to water-mint, and other flowers. Univoltine, flying in July–August.

Euroriental, of Anatolian-Iranian origin.

Family: LIBYTHEIDAE

67. *Libythea celtis* Fuessl.

THE SNOUT BUTTERFLY.

Inhabits well-wooded rocky places at Middle Heights in the mountains.

Foodplant: the *Celtis* tree. Bivoltine, flying in April and August.

Euroriental, of Anatolian-Iranian origin.

Family: NYMPHALIDAE

68. *Limenitis rivularis* Scop.

THE EASTERN WHITE ADMIRAL.

A woodland species, widely distributed in the mountains. It feeds on *Lonicera* and flies in one generation between June and August.

Euroriental, of Anatolian-Iranian origin.

69. *Thaleropsis ionia* Ev.

THE EASTERN TORTOISESHELL.

Has been taken once, at Sulaf, but may occur elsewhere in the mountains. The specimen was taken on a village house, among gardens between scantily wooded limestone mountains at Middle Heights, in June.

Anatolian-Iranian.

70. *Junonia orithya* L. ssp. here Lang.

THE PANSY BLUE (Pl. II, Fig. 3).

Inhabits the southern plains as far north as Baiji.

In the extreme south flies in most months of the year but in the central plain is less regular, and most frequently seen in the autumn. It appears to be an immigrant, and its early stages have not been observed in Iraq. Copulation has been observed in autumnal specimens flying near Bagdad. The foodplant, if any, in Iraq, is unknown. In India it feeds on *Justicia*, *Lepidagathis* and perhaps other *Acanthaceae*. These appear to be unknown in Iraq. Multivoltine. An oasis insect, favouring palm gardens, marshy fields, and riverside places.

A Palaeo-tropical species, centred in Asia.

*** 71. *Vanessa cardui* L.**

THE PAINTED LADY.

This well-known migrant occurs throughout the length and breadth of Iraq.

It feeds principally on *Malva parviflora*; thistles are also eaten, and occasionally nettle. In gardens, artichokes are sometimes defoliated, and in winter and spring the larva is sometimes also to be found on hollyhocks (*Althaea rosea*). Though potentially multivoltine, the larva is less often seen than the butterfly. The larva is seen in the plains principally in the cooler months and in the mountains in the summer. The butterfly is seen in fair numbers in the plains in the cooler months, becomes commoner in the spring and early summer, and then disappears except for a few individuals which persist in the oases of the plain throughout the whole summer. The latter, unlike those seen at other seasons, sometimes come to light. They may be in a state of semi-aestivation, since no eggs or larvae have been seen in the plain at this season. In the mountains the butterfly appears on the wing in the spring and becomes numerous at increasing heights as summer progresses, returning from the heights in autumn. At great heights larvae are seen in midsummer. There is certainly a big immigration from the south into Iraq in the spring, and probably many emigrate southwards, in less obvious swarms, in the autumn.

A sub-tropical and tropical butterfly of almost world-wide range.

72. *Vanessa atalanta* L.

THE RED ADMIRAL.

This is also a migrant but behaves differently. It has not been observed south of Bagdad yet. It favours oases.

It feeds on nettle, but the larva has not yet been seen in Iraq. If it breeds here at all it will be in the mountains of the north. The butterfly has only been seen so far in oases of the plain in November or March to May. It is seen in single individuals, never in swarms. The requisite foodplant does not exist in the places where it has been seen, and it must therefore provisionally be classed as "a winter visitor", not a resident.

Euroriental, of Anatolian-Iranian origin.

73. *Aglais urticae* L. ssp. *turcica* Stgr.

THE SMALL TORTOISESHELL.

Not below 4000 ft. Elsewhere it is a migrant to some extent, and it may wander in Iraq among the mountains.

It feeds on *Urtica dioica*, the kind of stinging nettle found along high mountain streams. It is probably bivoltine.

Euro-Siberian.

74. *Polygonia polychloros* L.

THE LARGE TORTOISESHELL.

Known from the mountains. (?) Bivoltine, the autumn butterflies hibernating and reappearing in early spring. Foodplant, probably nettle.

Euroriental, of Anatolian-Iranian origin.

75. *Polygonia egea* Cr.

THE PELLITORY BUTTERFLY.

Widespread in the mountains, and recorded once from Mosul.

It feeds on pellitory (*Parietaria*) which grows on walls and cliffs, and in caves. Probably multivoltine, it flies off and on throughout the year from spring to autumn.

Euroriental, of Anatolian-Iranian origin.

76. *Polygonia c-album* L.

THE COMMA.

Occurs in the mountains but less widespread than the preceding, favouring cooler higher districts near the upper tree-line, e.g. the Barwar Bala valley north of Amadia.

Foodplant: *Urtica dioica*. There are two generations, the autumn brood hibernating and reappearing in spring. The summer brood flies in July–August.

Euro-Siberian.

77. *Melitaea cinxia* L. ssp. *amardaea* Gr. Gsh.

THE GLANVILLE FRITILLARY.

Flies at Upper Heights, in June at 6000 ft., and as late as August at 13,000 ft. Univoltine.

It feeds on plantain (*Plantago*) and other low herbs.

Anatolian-Iranian, with Euroriental range, from Britain to Central Asia.

78. *Melitaea collina* Led.

LEDERER'S MOUNTAIN FRITILLARY.

A single male was taken at Shaqlawa (2500 ft.) on 24th April, 1953. This is the first record of this East Mediterranean butterfly from Iraq; it was hitherto only known from the Lebanon and Turkey. Further east it is represented in Persia by *consulis* Wilts. and *turkmenica* Higg. in Transcaspia.

The butterfly perhaps feeds on *Centaurea*; it is univoltine.

79. *Melitaea arduinna* Esp.

THE LARGE CENTAURY FRITILLARY.

This Anatolian-Iranian butterfly is very common at Upper Middle Heights in early June and also flies in May at Middle Heights. The early stages, observed in Fars, were described in Wiltshire (1952).

There seems to be only one generation in a year and the foodplant observed at Shiraz was *Centaurea behen* L., a giant species with tobacco-like leaves. There is plenty of this in various parts of the Iraqi mountains and northern plains.

80. *Melitaea phoebe* Knoch.

THE PHOEBE FRITILLARY.

Inhabits upper Middle Heights in the mountains. Around Amadia f. *dorae* Graves, which extends down the Zagros to the Shiraz district in S.W. Persia and was described from Jordania, occurs; at greater heights, e.g. Haj Omran, the f. *caucasicola* Verity flies.

Its foodplant in Iraq has not been observed but elsewhere it feeds on *Centaurea*, *Scabiosa*, *Plantago*, etc. There is one generation which flies in early summer.

Euro-Siberian.

81. *Melitaea trivia* Schiff. ssp. *robertsi* Butl.

THE MULLEIN FRITILLARY.

This butterfly inhabits desert foot-hills and mountains; it probably inhabits many places in the northern deserts and steppes of Iraq.

It feeds on *Verbascum* and *Scrophularia*. There are three generations, two flying before midsummer and one in the autumn; perhaps at great heights the number of broods is less. The first brood examples, flying in March or April according to altitude, are larger than the next two. The males are fond of flying around and settling to sun themselves on the tops of hills or mountains, and are thus found often at great heights. The females wander less from the breeding ground. The early stages were described in Wiltshire (1946, ii).

The species is Euroriental, ranging from Portugal through Southern Europe to N.W. India.

(N.B.—It is wrong to use the name *persea* Koll. for *trivia* forms as some previous authors have done. *M. persea* is a good species and is dealt with below.)

(N.B.—Some previous authors have referred to a *Melitaea* inhabiting Iraq and Iran as *M. didyma casta* Koll. The name *casta* cannot be used for any species in this group, the species *casta* Koll. being quite different; it has not yet been found in Iraq but might be found there, perhaps near Sulaimaniya. True *casta* is only known yet from Iran. The forms referred to by Riley (in Peile) as *didyma-casta* are in fact *persea* Koll. forms, see below.)

82. *Melitaea didyma* Ochs.

THE TOADFLAX FRITILLARY.

Rather rare, and only found in the mountains.

Univoltine or partially bivoltine, flying chiefly in June–July, occasionally and locally in August. Its foodplant in Iraq has not been observed but elsewhere it feeds on *Linaria*, *Plantago*, *Teucrium*, etc.

Anatolian-Iranian with Euroriental range.

83. *Melitaea gina* Higg.

THE IRANIAN TOADFLAX FRITILLARY.

Inhabits the mountains near Sulaimaniya, flying at Middle Heights in May.

Partially bivoltine, with a second brood in September, which is less common than the first in May–June.

Anatolian-Iranian, principally inhabiting Iran, where it is a vicariant of true *didyma*.

84. *Melitaea perseia* Koll. ssp. *taurica* Belter.

KOLLAR'S PERSIAN FRITILLARY.

Inhabits Middle and Upper Heights of the mountains.

Partially bivoltine, flying in June, July, August and September. Foodplant *Linaria*.

Anatolian-Iranian, ranging from East Turkey to N.W. India.

(The form *sargon* Hemming (1932) was described as being from Bagdad; it appears to be typical *perseia* Koll. from the South Zagros, and probably was wrongly labelled, as regards locality. In the typical *perseia* forms from South-west Persia the females are larger and more marked than the males, and the hindwing underside is white. These characters are less evident in the N. Iraqi form which extends into Eastern Turkey.)

85. *Issoria lathonia* L.

THE QUEEN OF SPAIN FRITILLARY.

Widespread in the mountains.

Feeds on *Viola*, *Anchusa*, *Onobrychis*, etc. It flies throughout the summer and early autumn but the phenology has not been closely studied.

Euroriental, perhaps of Himalayan origin.

86. *Damora pandora* Schiff.

THE GREAT FRITILLARY.

In the plains it has been recorded only from Mosul and is doubtless restricted to gardens; in the mountains it is more widespread and common, but even there especially favours gardens and orchards, liking to settle, on hot summer noontides, in leafy branches. In the autumn it is often seen at garden flowers such as *Zinnia*, as the mountain blooms are then fewer.

It feeds on violets (*Viola*) and flies in one generation in summer and early autumn.

Anatolian-Iranian, with Euroriental range.

87. *Argynnis paphia* L.

THE SILVER-WASHED FRITILLARY.

Only known so far from Amadia, c. 4500 ft. It feeds on violets and flies in two generations, the first in May-June, the second from July to September.

Euro-Siberian.

88. *Fabriciana niobe* L. ssp. *taura* Roeb.

THE NIOBE FRITILLARY.

Widespread in the mountains at Middle Heights. It feeds on violets and has one generation, flying in early summer.

Anatolian-Iranian, with Euroriental range.

89. *Brenthis hecate* Schiff. ssp. *caucasica* Stgr.

THE HECATE FRITILLARY.

Occurs at 6000 ft. in the mountains on the lower slopes of higher peaks, especially near streams.

It feeds on bramble (*Rubus*) and is univoltine, flying in June-July. The early stages were described in Wiltshire (1946, ii).

Anatolian-Iranian, with Euroriental range.

Family: DANAIDAE

*** 90. *Danais chrysippus* L.**

THE PLAIN TIGER, OR INDIAN MILKWEED BUTTERFLY.

Occurs in the plains, but has not been recorded north of the Dyala foot-hills. It may be a true resident in the south of Iraq and doubtless survives in some winters there and perhaps further north in very mild winters. It is a migrant and becomes commoner towards the autumn, when it is found at its northern limits.

It feeds on Bloodflower in gardens (*Asclepias curassavica*). If, in the south, *Calotropis procera* exists, this would be its only wild foodplant. It is multivoltine.

Palaeo-tropical, migrating into sub-tropics.

Family: SATYRIDAE

91. *Melanargia larissa* Hübn.

THE NEAR EAST MARBLED WHITE.

Both *f. taurica* Roeb. and *iranica* Seitz are found; it is doubtful whether these are separate species as some think. They inhabit Middle Heights and a thousand feet above the tree-zone in the mountains.

Foodplant: grasses. There is one generation, flying in June-July.

Anatolian-Iranian.

92. *Hipparchia syriaca* Stgr.

THE SYRIAN TREE-GRAYLING.

Inhabits woods at Middle Heights, preferring those with tall trees.

It feeds on grasses. It is univoltine, flying in June-July, and settling on tree-trunks.

Anatolian-Iranian, ranging from Cyprus to S.W. Persia.

93. *Hipparchia pellucida* Fruhst.

THE KURDISH GRAYLING.

Rather scarce, inhabiting the Suwara Tooka woodland area at Middle Heights.

It feeds on grasses and is probably univoltine, flying in May-June.

Anatolian-Iranian. (Identity has been confirmed by male genitalia.)

94. *Hipparchia fatua* Freyer

FREYER'S GRAYLING.

Not uncommon at Middle Heights, in mountain woods.

It feeds on grasses. It is univoltine, flying from July to September.

East Mediterranean.

95. *Hipparchia parisatis* Koll. subsp. *macrophthalmus* Ev.

THE WHITE-BORDERED BLACK.

At Middle Heights in the mountains, not numerous. Probable foodplant: grasses. Univoltine, flying from July to September.

Anatolian-Iranian, extending eastwards to Central Asia and N.W. India.

96. *Kanetisa circe* F. ssp. *asiatica* Stgr.

THE GREAT BLACK GRAYLING.

This handsome insect inhabits Middle Heights in the mountains, preferring wooded country and also haunting gardens and orchards.

It feeds on grasses, and flies from July to October probably in one generation.

Anatolian-Iranian, with Euroriental range, from S. Europe to Central Iran.

97. *Satyrus favonius* Stgr.

THE ORIENTAL MOUNTAIN GRAYLING.

Flies at 6000–7000 ft. in the high mountains, and is usually seen in single specimens, though sometimes more numerous in sheltered stream-beds. One generation, flying in July–August.

Anatolian-Iranian.

98. *Satyrus pimpla* Feld.

THE ORIENTAL PEAK GRAYLING.

Occurs at 8000 ft. in the high mountains of N.E. Iraq.

Probable foodplant: grasses. Univoltine, flying in July–August.

This Anatolian-Iranian species extends eastwards to N.W. India.

99. *Pseudochazara pelopea* Klug.

THE PELOPEA GRAYLING.

Inhabits desert foot-hills and mountains.

Foodplant: grasses. Probably bivoltine, flying in May at low altitudes, and continuing on the wing until October at Middle and Upper Heights.

Anatolian-Iranian, with Euroriental range.

100. *Chazara thelephassa* Hübn.

THE THELEPHASSA GRAYLING.

Inhabits desert foot-hills, and the northern plains; and is widespread and common in the mountains.

Foodplant: grasses. At low altitudes flies in March–May and October. The two generations are less well separated in the mountains.

Anatolian-Iranian, with Euroriental range.

101. *Chazara briseis* L. ssp. *hyrcana* Stgr.

THE GREAT TAWNY GRAYLING.

Common in the mountains from 2000 to 9000 ft. Very occasional in desert foot-hills.

Foodplant: grasses. Flies from June to October, probably univoltine.

Anatolian-Iranian, with Euroriental range.

102. *Chazara persephone* Hübn. (= *anthe* Ochs.)

THE GREAT STEPPE GRAYLING.

Inhabits desert foot-hills and bare mountains up to 8000 ft.

Foodplant: grasses. Probably bivoltine, flying in the foot-hills in April–May and in the mountains from May to September.

Anatolian-Iranian.

103. *Pararge roxelana* Chr.

THE LATTICE BROWN.

Widespread in the woodland zone. It feeds on grasses; the early stages were described in Wiltshire (1948, i). It flies from June to September, the number of generations not having been ascertained (one or two).

Anatolian-Iranian.

104. *Pararge climene* Esp. ssp. *alticola* LeCerf.

THE IRANIAN ARGUS.

Inhabits the mountains at 6000-7000 ft. Probable foodplant: grass. Univoltine, flying in June-July.

Anatolian-Iranian.

105. *Pararge egeria* L. ssp. *vulgaris* Z.

THE SPECKLED WOOD.

Inhabits the woodland zone of the mountains. Feeds on grasses. Is multivoltine but has only been taken in Iraq in June, probably the second of three generations.

Euroriental.

106. *Pararge megera* L. ssp. *iranica* Riley.

THE WALL BUTTERFLY.

Inhabits desert foot-hills and mountains, being commoner in the latter. Frequents ridge-tops, rock-faces, vineyard-walls and garden flowers.

There are two, perhaps more, generations a year. In the Dyala foot-hills the first flies in February-March; at Middle Heights, in April-May. It is also seen in the mountains in most months until October. It feeds on grasses.

Euroriental.

107. *Pararge menava* Moore.

THE SOOTY ARGUS.

Inhabits Upper Heights, frequenting rocky peaks. Univoltine, flying in midsummer. Probable foodplant: grasses.

Anatolian-Iranian.

108. *Epinephele jurtina* L. ssp. *persica* LeCerf. (Pl. III, Fig. 6).

THE MEADOW BROWN.

The local race has large blackish males and is only found at considerable heights, i.e. about 6000 ft., liking meadows more than dry mountain sides. Probably univoltine, flying in July.

Anatolian-Iranian, with Euroriental range.

109. *Epinephele telmessia* Z. ssp. *kurdistana* Ruhl. (Pl. III, Fig. 7).

THE EASTERN MEADOW BROWN.

In the Iraqi race the males are smaller than the females and the forewing uppersides have a light orange cloud on the brown ground. It inhabits Middle Heights chiefly, but in places doubtless overlaps with the preceding.

It is probably bivoltine and is seen from early summer to autumn. It is especially common on grassy spots, e.g. river banks, lower mountain slopes; in midsummer it seeks out shady spots, where congregations may often be flushed out. Foodplant: grasses.

Anatolian-Iranian.

110. *Epinephele wagneri* H.-S.

THE BLIND-EYED ARGUS.

A mountain species, flying in rocky places at 5000–6000 ft., and fond of congregating in the shade of rocks or sipping from water-mint flowers.

Number of generations, not known; flies between June and September. Probable foodplant: grasses.

This Anatolian-Iranian species ranges from East Turkey to Central and South-west Persia. Around Shiraz the more luxuriant form *mandane* Koll. occurs, but this name should not apply to the Iraqi form.

111. *Hyponephele lupinus* Costa ssp. *centralis* Riley.

THE SMALL ORIENTAL MEADOW BROWN.

The sooty, almost featureless upperside of the male and the two bold eye-marks on the female on a contrasting pale patch of the forewing should enable this species to be distinguished from *jurtina* and *telmessia* at a glance. It has a wider range than they have, inhabiting the foot-hills, e.g. the desert hills of the Dyala province, as well as more widely throughout the Middle Heights of the mountains. It reaches 6000 ft. at least, where it overlaps with the following species.

Foodplant: grasses. Flies in April–June in the foot-hills and from May to October in the mountains. Probably bivoltine. Its habits are similar to those of No. 109.

Anatolian-Iranian, with Eurooriental.

112. *Hyponephele lycaon* ssp.

THE ORIENTAL PEAK BROWN.

Slightly smaller than the preceding, and with the male upperside equally featureless except for the faint apical eye-spot, but more velvety, less sooty. The female upperside is monotonous, though with two dark eye-spots. It occurs at heights of 6000–9000 ft. in the high mountains.

Foodplant: grasses. Probably univoltine, flying in June–July–August.

Euro-Siberian.

113. *Coenonympha pamphilus* L. ssp. *hylas* Esp.

THE SMALL HEATH.

Inhabits the mountains, and is widespread. Bivoltine, flying in April–May, and again in June–July. Foodplant: grasses.

Euro-Siberian.

114. *Coenonympha saadi* Koll.

THE PERSIAN SMALL HEATH.

Widespread in the mountains and more common than the preceding. It flies from May to July, in one or two generations, and the foodplant is doubtless grasses.

This Anatolian-Iranian species ranges from East Turkey to Iran, where it is widespread. I have series from the Elburz, from Central Persia, from Fars, and from Iraqi Kurdistan and can detect no racial difference between any of the populations. It is variable in all localities.

Super-family: HESPERIOIDEA

Family: HESPERIIDAE

115. *Erynnis tages* L. ssp. *unicolor* Freyer.

THE DINGY SKIPPER.

Inhabits the upper woodland zone of the mountains.

Bivoltine, flying in May and July–August. The foodplant in Iraq has not been observed; in Europe it is *Coronilla* and *Lotus*.

Anatolian-Iranian, with Euroriental range.

116. *Erynnis marloyi* Boisd.

THE ORIENTAL JET SKIPPER.

Inhabits sunny, stony slopes at Middle Heights, but is rather uncommon in Iraq.

Apparently bivoltine, for it has been taken in late April at Shaqlawa, and late July at Derband, nr. Rowanduz. Foodplant: not recorded.

Anatolian-Iranian, from the Balkans to N.W. India.

*** 117. *Carcharodus alceae* Esp. ssp. *insolatrix* LeCerf.**

THE HOLLYHOCK SKIPPER.

Inhabits oases of the Central Plain, and is more widespread in the mountains and probably the Northern plain.

The foodplant is *Althaea*, hollyhock, of which at least one species grows wild commonly in the mountains and of which the well-known *A. rosea* is cultivated in gardens. Although inhabiting Ahwaz the butterfly has not been seen in the Basra area. Multivoltine, all the year round in the Central Plain, where it is on the wing from February to November, and in the larval stage during the winter and summer months. In the summer the butterfly is paler than in the winter.

Anatolian-Iranian with Euroriental range.

118. *Carcharodus floccifera* Z. ssp. *orientalis* Rev.

THE VELVET SKIPPER.

Inhabits Upper Heights of the mountains.

Bivoltine, flying in May–June, and July–August. The probable foodplant is *Phlomis*.

Anatolian-Iranian, with Euroriental range, from the Canaries and S. Europe to N.W. India.

(Probably *Carcharodus stauderi* ssp. *ambigua* Vty. will be found in Iraq, particularly in the Dyala or Sulaimanya regions, since it is known from Harir, West Persia. It is an Eremic species with a range parallel but more southerly than the above, and feeds on *Phlomis*.)

119. *Spialia osthelderi* Pfr.

OSTHELDER'S SKIPPER.

Inhabits desert foot-hills and lower Middle Heights of mountains.

Anatolian-Iranian.

(Probably *Spialia doris* Walk. which is known from Ahwaz in S.W. Persia and is an Eremic species, inhabits the eastern foot-hills of Iraq also. The occurrence of *Spialia geron* Watson now seems improbable.)

120. *Spialia sertorius* Hoffm. (= *orbifer* Hübn.) ssp. *hilaris* Stgr.

THE ORBIFEROUS SKIPPER.

Flies at 4000–6000 ft. in the mountains. Bivoltine, flying in May–June and July–August.

Anatolian-Iranian with Euroriental range.

121. *Muschampia tessellum* Hübn. ssp. *tersa* Evans.

THE LARGE CHEQUERED SKIPPER.

Probably widespread in the mountains although hitherto only taken at Rayat at about 4500 ft. Apparently univoltine, flying in June.

Euro-Siberian, from the Balkans to N.E. China.

122. *Muschampia proto* Ochs. ssp. *lycaonius* Wagn.

THE PROTO SKIPPER.

Inhabits both desert foot-hills and mountains up to 8000 ft.

Appears in two generations, flying at low altitudes in May and October–November, but with less interval at greater heights. Foodplant, not recorded.

Anatolian-Iranian, with Euroriental range.

(It might here be mentioned that Evans (1949) records from Iraq a third species in this genus, but also gives the locality more exactly as Malatya, which is in fact in S.E. Turkey. It seems most probable that this species, viz. *poggei* Led., will also be found to reside in Kurdistan, Iraq.)

123. *Pyrgus armoricanus* Ob. ssp. *persicus* Rev.

OBERTHÜR'S SKIPPER.

Inhabits the mountains, from 4000–6000 ft. Bivoltine, flying in May and July–October.

Anatolian-Iranian, with Euroriental range.

124. *Pyrgus serratulae* Ramb. ssp. *alveoides* Stgr.

RAMBUR'S SKIPPER.

This butterfly resembles the preceding and is best distinguished by the genitalia. It has not been taken so widely or frequently in Iraq but its range and habitats are similar, likewise its phenology. It extends down the Zagros into N. Fars at least, though Evans does not mention its occurrence east of the Lebanon.

125. *Thymelicus lineola* Ochs.

THE ESSEX SKIPPER.

Inhabits the Northern Plains near Mosul and the mountains. At lower altitudes it flies in April. It seems to be univoltine.

In Iraq it probably feeds on grasses and perhaps other herbs. Elsewhere it has been reported as feeding on *Arrhenatherum* and *Prunus*.

Holarctic.

126. *Thymelicus hamza* Ob. ssp. nova Rev.

THE NEW SMALL SKIPPER.

Inhabits Middle Heights of the mountains. Univoltine, flying in May. Probable foodplant: grasses.

Iranian-Mauretanian.

(N.B.—The record of *T. sylvestris* Poda (= *thauamas* Hufn.), No. 110 in the first edition, for Iraq, cannot be sustained on a more careful examination of the material.)

127. *Thymelicus actaeon* Rott. ssp. *heydeni* Plotz.

THE LULWORTH SKIPPER.

Inhabits grassy places at Middle and Upper Middle Heights. Univoltine, flying from May to July. Foodplant: grasses.

Anatolian-Iranian, with a Euroriental range, from the Elburz mountains in N. Iran to South Britain.

128. *Hesperia comma* L. ssp. *pallida* Stgr.

THE SILVER-SPOTTED SKIPPER.

Only above the tree-line in the mountains. Univoltine, flying in July–August. The foodplant in Iraq has not been observed but in Europe is known to be *Festuca ovina*, and *Coronilla*.

Euro-Siberian.

129. *Ochlodes venata* Br. & G. ssp. *faunus* Tur.

THE LARGE SKIPPER.

Rather scarce and only at Upper Middle Heights, in grassy places. Univoltine, flying in June and July. Foodplant: grasses.

Euro-Siberian.

130. *Gegenes pumilio* Hoffm.

THE COAL SKIPPER.

Inhabits the Northern desert and the desert foot-hills, but perhaps only in damp places.

Foodplant: grasses. Bivoltine, flying in May and October.

An Ethiopian tropical species which penetrates the Mediterranean and South-west Asia.

131. *Gegenes nostradamus* F.

THE PEATY SKIPPER.

Range, habitat, foodplant and phenology in Iraq, not very different from the preceding. Rare in Bagdad gardens.

An Asiatic tropical species which penetrates the Mediterranean basin.

*** 132. *Pelopidas thrax* Hübn. ssp. *midea* Walker.**

THE MILLET SKIPPER.

Common among coarse grasses in oases of the plain; also visits, as adult, garden flowers. Multivoltine, flying in early and late summer. It feeds on grasses and perhaps cereals.

An Asiatic tropical species penetrating the Mediterranean basin. Early authors wrongly recorded it from Iraq under the name *mathias* F.

133. *Eogenes alcides* H.-S.

THE ALCIDES SKIPPER.

Inhabits the desert foot-hills and mountains, perhaps only breeding in damp places, up to about 6000 ft. Bivoltine, flying in May and August–September.

Anatolian-Iranian.

Super-family : BOMBYCOIDEA.

Family : SATURNIIDAE.

* **134. *Saturnia pyri* Schiff.**

THE GIANT EMPEROR MOTH.

Inhabits the mountains. Feeds on apple and perhaps other fruit-trees, also willow foliage (*Salix*). Univoltine, flying in April–May.

Anatolian-Iranian, with a Eurooriental range from the Mediterranean basin to South-west Persia, where it feeds on *Populus euphratica* and *Amygdalus spartioides*.

Family: LEMONIIDAE

135. *Lemonia peilei* Roths.

Inhabits desert foot-hills, the Northern desert, and Middle Heights of the mountains.

Foodplants: low herbs. Univoltine, flying in October–November. The early stages were described in Wiltshire (1946, iii and 1952).

Anatolian-Iranian. In the desert of Eastern Syria the form *talhouki* Wilts. with bleached males, flies as a race ; while in Persia the subsp. *farsica* Wilts. is widespread.

Family: LASIOCAMPIDAE

136. *Chondrostega* (?) *pauli* Gaede.

Inhabits the mountains, having been taken at Ser Amadia. Univoltine autumnal, flying in September.

Anatolian-Iranian. (This form corresponds to the figure and description in Seitz, Vol. II Supplement, except that the eyes are not hairy.)

137. *Chondrostega fasciana* Stgr. subsp. *feisali* Wilts. (comb. nov.) (Pl. IV, Figs. 16 and 17).

Inhabits the stony or sandy deserts, but not the mud plain, of Central and Southern Iraq, from near Basra to Haditha and the Dyala Province at least. The Iraqi subspecies was first described in Wiltshire (1941, ii) and illustrated in the first edition of this bulletin (1944, i).

The black-banded red or yellow hairy caterpillars, which feed on low plants, and love sunshine, often swarm in March–April, attracting the attention of birds as well as men. According to the late Capt. Corry, the Lesser Bustard is particularly fond of preying on them and when doing so is less wary and more easily approached by hunters; other birds, e.g. plovers (Arab. *Smug*; pl. *Simjan*) can also be caught in the same way. The cocoon in which the larva pupates is often as much as nine inches deep. The pupal diapause lasts

the whole summer and the moth, which is univoltine, emerges in late September or early October. The female is wingless. Further details of the early stages were published in Wiltshire (1946, ii).

An Anatolian-Iranian, Eremic species. (On structural grounds I now consider *fasciana*, *aurivillii* and *feisali* conspecific; very probably the pure white form inhabiting Arabia is also a race of the same species.)

138. *Eriogaster amygdali* Wilts.

Inhabits the woodland zone of the mountains.

Univoltine, flying in September. The larva, which until the last instar feeds on bushes in a web gregariously, might conceivably damage fruit trees; its known foodplants are wild *Prunus*, *Amygdalus* and *Crataegus* bushes and trees. The early stages were more fully described in Wiltshire (1943) and the species was described in Wiltshire (1941, i).

An Anatolian-Iranian species, only known so far from the Zagros which it inhabits from the Amadia region to Fars (S.W. Persia).

139. *Eriogaster philippsi* Bart. ? subsp. n. (Pl. I, Fig. 15).

Inhabits oak woods in the mountains.

Univoltine, probably flying in early November. The larva feeds on oaks (*Quercus*) and is gregarious in flat webs usually at the roots of trees. Their position is thus different from that of the typical *philippsi* of the Lebanon, whose webs are high in oak branches. The larval coloration differs (see Plate I, Figs. 14, 15). Unfortunately efforts to rear the adult from larvae at Shaqlawa and Salah-ud-Din were unsuccessful and the adult has not yet been captured. The naming of this moth must therefore be deferred.

A local Anatolian-Iranian species.

140. *Chilena proxima* Stgr.

Inhabits Middle Heights from about 2500 ft., as at Shaqlawa, down into the plains and to the extreme south except that it is not known yet from the Basra area, though known from Ahwaz, in an adjacent part of Persia. It accompanies its foodplant which occurs both in deserts and on cultivated ground, being a very prevalent woody dwarf thorn. It is commonest where this thorn grows into dense thickets, that is, on rather neglected oasis terrain.

Foodplant: *Prosopis stephaniana* (Arab. *Shok*). Multivoltine, throughout the summer. The early stages were described in Wiltshire (1940).

An Anatolian-Iranian Eremic moth.

140a. *Malacosoma castrensis* L. ssp. *kirghisica* Stgr.

Flies at Upper Heights in June-July. Foodplants: various flowering herbs. Anatolian-Iranian, with Euroriental range.

141. *Lasiocampa eversmanni* Ev.

Common in the Middle Heights of the mountains. It feeds on *Astragalus* and probably other *Papilionaceae*; it is univoltine, flying in September–November.

An Anatolian-Iranian species.

142. *Lasiocampa terreni* H.-S.

Flies at Middle Heights, less commonly than the preceding, and in the Northern Plain, e.g. near Mosul.

It feeds on grasses and low herbs. Univoltine, flying in September–October. The early stages were described in Wiltshire (1935).

Anatolian-Iranian.

143. *Lasiocampa grandis* Rog.

An indisputable example of this species was recently taken at Sheikh Adi (Lower Middle Heights), so that the doubt attending a previous record from Amarah in May has been removed, at least to the extent that the species can be considered an Iraqi one, though whether the Amarah specimen was correctly named is still uncertain. In Transcaucasia and S.W. Persia the recently described and rather similar *Lasiocampa piontkovskii* Shelj. replaces *grandis* and the Amarah example might be that. Moreover, the date (May) is not typical of either species.

The larva is very polyphagous in the Lebanon; the moth is univoltine, usually emerging, after a pupal diapause, in September or October.

An East-Mediterranean species, ranging from the Nile delta through Palestine and the Lebanon into S.E. Turkey and N. Iraq. Iraq is its eastern limit.

144. *Pachypasa otus* Drury.

Inhabits the woodland zone of the mountains. Foodplants: oak (*Quercus*) and *Pistacia*. Univoltine flying in July–August.

An Anatolian-Iranian species ranging from Greece to Fars, S.W. Persia.

*** 145. *Nadiasa siva* Lef.**

Inhabits the southern and central plain, principally in the oases; also, more rarely, in the mountains of the north-east.

Foodplants: Christ-thorn (*Zizyphus spina-christi*) (Arab. *Nebek*), poplar (*Populus euphratica*), tamarisk (*Tamarix*), pomegranate (*Punica*), apple, willow (*Salix*), and *Prosopis stephaniana* (Arab. *Shok*), and perhaps other trees and bushes.

It is bivoltine, but not very punctually; for instance, most gen. 2 larvae pupate in late autumn but some hibernate and pupate in the spring, so that the first emergence is rather spread, between March and May; the second emergence is also variable between September and November. In India it is also reported as bivoltine, with a diapause in the dry season. Unlike many species which in hot climates produce more generations this species appears specifically bivoltine even if its dates of hatching are somewhat variable.

An Asiatic tropical species, with whiter male hindwing and heavier genitalia than a rather similar species, *N. repanda* Hübn., which might also be found in Iraq, to judge from its distribution in the Middle East. *N. repanda* is less tropical, being Pan-Eremic in range; it extends from Central Asia to South Persia, where *N. siva* crosses its area, replacing it on warmer biotopes. *N. repanda* reappears in Egypt and N.W. Africa, where it is polyphagous; in the S. Zagros it feeds on *Amygdalus spartioides* which is a dominant tree in some areas there, and which also is found, but less commonly, in Iraqi Kurdistan. *N. siva* is at its western limit in Central Iraq.

Family: ENDROMIDAE

146. *Cilix glaucata* Scop. subsp. *asiatica* Stgr.

Inhabits the woodland zone of the mountains. Feeds on *Crataegus* and *Prunus*. Univoltine, with an emergence extending from June to August. Holarctic.

Family: SPHINGIDAE

*** 147. *Acherontia styx* Westw.**

THE EASTERN DEATH'S HEAD MOTH.

Only known from the south and central plains, and there confined to oases.

Foodplants: *Duranta* (an ornamental shrub), pumpkin leaves (*Cucurbita*) and probably *Lycium*. Precise details of the phenology in Iraq are lacking. Probably bivoltine, between May and October.

An Asiatic Tropical species, here at its north-west limit. It is interesting to note that the Ethiopian-Tropical species which has penetrated Europe, *A. atropos* L., occurs on the south coast of Arabia as far east as Dofar (Qara Mts.). The Arabian and Syrian deserts appear to be the barrier preventing these and other Asiatic and Ethiopian tropical species from meeting.

*** 148. *Herse convolvuli* L.**

This migrant is widespread in Iraq. Probably it only breeds in oases and in the mountains.

Foodplants: *Convolvulus* and *Ipomaea batata* (see Rao, 1921).

Palaeo-tropical.

149. *Smerinthus kindermanni* Led.

From the north to the south of Iraq, but not migratory. Only found where willows grow, and therefore an oasis insect in the plains. Even in the mountains it is only found near watercourses, but these are more numerous there.

Foodplant: willow (*Salix*). Multivoltine, appearing in the plains in three well separated generations, but doubtless fewer at greater heights. At Bagdad the moth emerges in March, May, and September.

An Anatolian-Iranian species.

150. *Marumba quercus* Schiff.

Confined to the woodland zone of the mountains.

Foodplant: Oak (*Quercus*). Bivoltine, flying in May and July.

Anatolian-Iranian, with Euroriental range from Portugal to Lower Austria and near Shiraz, S.W. Persia.

*** 151. *Laothoe populi* L. ssp.**

Confined to Middle Heights of the mountains.

Foodplant: poplar and willow (*Populus* and *Salix*). Probably bivoltine. So far has only been taken in late August (a pair at Shaqlawa, to light), presumably a second generation.

Euro-Siberian. A number of different local populations occur in Asia Minor and it is hard to name the Iraqi form which comes near *intermedia* Eichl. It is not so tawny and pale as ssp. *populeti* Bien. from N. Persia and Central Asia. Each population is itself variable in colouring.

* 152. *Daphnis nerii* L.

This migrant is widespread in its appearances, both in the plain and mountains. The yearly variation in its numbers seems to show that despite the commonness of its foodplant in oases of the plain and (wild) in submontane water-courses, it might disappear without constant immigration, presumably from the south.

Foodplant: *Nerium* and *Vinca*. Occasionally it is so common as to defoliate oleander (Arab. *Diff*) bushes. It is one of the few creatures to feed on these poisonous but ornamental bushes.

Palaeo-tropical.

*153. *Berutana kotschy* Koll.

Restricted to the mountains, at Middle Heights, and there quite common in and around villages such as Shaqlawa.

Foodplant: vine (*Vitis*). It should be noted that the vine grows wild in the river beds of Kurdistan. The moth is bivoltine, flying in May and August, approximately.

Anatolian-Iranian.

153a. *Rethera brandti* B.-H. ssp. *euteles* Jordan (1937).

Inhabits desert foot-hills of the Upper Dyala basin. Univoltine, flying in April. Early stages, unknown.

Anatolian-Iranian. This race extends south-westwards into South Persia, while the typical form inhabits hilly steppe in N. Iran (Teheran district).

153b. *Rethera komarovi* Christ.

Inhabits Upper Heights. Univoltine, flying in June.

Anatolian-Iranian.

154. *Akbesia davidi* Ob.

This beautiful rarity, only hitherto recorded from E. Turkey, comes to light in August at Sersang, at Middle Heights in the mountains of Northern Iraq. It has not been taken yet south or east of that district. The life history is unknown.

Anatolian-Iranian.

155. *Sphingonaepiopsis gorgon* Esp. ssp. (?) *pfeifferi* Zy.

This miniature Hawkmoth flies at Haj Omran and doubtless elsewhere at Upper Heights in August. Its life history is unknown.

The species is Anatolian-Iranian, ranging northwards to S. Russia and westwards only to the Lebanon. The Iraqi form is certainly nearer the Lebanese (*pfeifferi*) than the S. Russian (*gorgon*) but probably it will be necessary to distinguish the E. Turkish and N. Iraqi forms with a different name.

156. *Macroglossa stellatarum* L.

THE HUMMING-BIRD HAWKMOTH.

A migrant, occurring all over Iraq. It feeds on *Galium* and, though probably potentially multivoltine, may not have more than two generations in the year; the larvae have, in the Middle East, only been seen at considerable heights, e.g. 6000 ft. *Galium* grows at lower altitudes than this in Iraq, of course, and future observation must show whether it breeds where it is seen as an adult. It disappears from the plain in the summer but is commonly seen there entering buildings in the autumn in order to hibernate. The hibernation is a restless phase for on sunny days the moth often tries to leave the house and may be seen trapped on windows.

Anatolian-Iranian, with Euroriental range.

157. *Celerio euphorbiae* L.

THE SPURGE HAWKMOTH.

Inhabits the mountains. Bivoltine, feeds on *Euphorbia*.

Anatolian-Iranian, with Euroriental range.

158. *Celerio nicaea* de Prun.

THE GREATER SPURGE HAWKMOTH.

Inhabits the mountains being rather rare at Middle Heights and quite common at 6000 ft. Probably bivoltine. Feeds on *Euphorbia*. The larva is much more easily distinguished from the preceding than the adult.

Anatolian-Iranian, with Euroriental range.

*** 159. *Celerio lineata* F. ssp. *livornica* Esp.**

THE STRIPED HAWKMOTH.

This migrant occurs all over Iraq. In the spring it breeds for one or two generations in the plains, both in deserts and oases. In the summer it is common at Upper Heights. The larva has been chiefly seen in spring and early summer and perhaps the examples seen at Upper Heights are migrating adults which have bred elsewhere. Whether or not some individuals remain and breed in the plains is not sure.

Foodplants: vine (*Vitis*), snapdragon (*Antirrhinum*), dock (*Rumex*), plantain (*Plantago*), *Prosopis stephaniana*, asphodel, and other plants. Multivoltine.

Holo-Tropical-Subtropical, the New World race being well differentiated from the Old World.

159a. *Pergesa suellus* Stgr.

Inhabits Upper Heights. Univoltine, flying in June. Probable foodplant: *Galium*.
Anatolian-Iranian.

*** 160. *Hippotion celerio* L.**

THE SILVER-STRIPED HAWKMOTH.

This migrant is much less frequent than No. 159. It has been taken in oases of the plain now and then.

Foodplant : vine (*Vitis*). Multivoltine.

Palaeo-tropical.

* **161. *Theretra alecto* L. ssp. *cretica* Boisd.**

Very common in oases of the plain and Middle Heights. Doubtless a migrant, but well established.

Foodplant: vine (*Vitis*). Multivoltine.

An Asiatic Tropical moth penetrating the Mediterranean basin.

Super-Family: PHALAENOIDEA

Family: SYNTOMIDIDAE (= AMATIDAE).

162. *Syntomis* (= *Amata*) *wiltshirei* B.-Salz. (Pl. IV, Fig. 20).

This species, originally described in Bytinski-Salz (1939) is only known yet from the high mountains of N.E. Iraq at 7000–9000 ft.

It flies by day in June–July on steep slopes and is univoltine.

A local Anatolian-Iranian species.

163. *Syntomis* (= *Amata*) *aurivala* Schaw.

This endemic species is only known yet from the desert hills near Mosul (700–1000 ft.)

It flies by day in May; apparently univoltine. A local Anatolian-Iranian, Eremic species.

164. *Dysauxes hyalina* Freyer.

Widespread in the mountains, commonest at Middle Heights. Bivoltine, flying by night in June and September–October.

Anatolian-Iranian.

Family: ARCTIIDAE

165. *Celama harouni* Wilts. (Pl. IV, Fig. 22).

This species, described in Wiltshire (1951), inhabits oases of the central and southern plain.

Probable foodplant: *Tamarix*. Multivoltine.

Anatolian-Iranian, Eremic.

166. *Celama turanica* Stgr. (Pl. IV, Fig. 23).

Inhabits oases of the plain.

Probable foodplant: *Tamarix*. Multivoltine.

Anatolian-Iranian, Pan-Eremic.

167. *Celama strigula* Schiff.

Inhabits the woodland zone of the mountains.

Foodplant: oak (*Quercus*). Bivoltine, flying in April and September.

Anatolian-Iranian, with Euroriental, range, from Western Europe to S.W. Persia, down the oak belt of the Zagros.

168. *Nola subchlamydula* Stgr.

Inhabits oases at Middle Heights of the mountains. Bivoltine like the preceding. The foodplant is uncertain in Iraq.

Anatolian-Iranian, with Euroriental range.

169. *Roeselia togatulis* Hübn.

Inhabits the woodland zone of the mountains. Perhaps multivoltine; it has been taken at various dates between spring and late autumn.

Anatolian-Iranian, with Euroriental range.

170. *Lithosia muscula* Stgr. ssp. *brevifurca* ssp. n. (Pl. II, Fig. 14).

This form, almost impossible to distinguish from typical *muscula* from Lebanon and Cyprus by facies, has nevertheless a constant difference in male genitalia and may even be a new species. It is only known from the woodland zone of the mountains of Iraq.

Antenna of ♂, with sparse long cilia, of ♀, simple.

Base of antenna with whitish scales.

Head and thorax, pale yellowish. Anal tuft of ♂, slightly orange.

Forewing with arched costa, greyish ochreous, usually more whitish along and near the costa. Hindwing pale ochreous, with a grey suffusion which hardly reaches the termen. Underside forewing strongly suffused with sooty grey, except on the costa, near the apex, and submarginally. There is no trace of cross bands. Underside hindwing, as upperside.

Span: 22–26 mm.

Male genitalia (Text-fig. 1, Pr. 596), distinguished by the shortened furca from those of typical *muscula* (Text-fig. 1, Pr. 597).

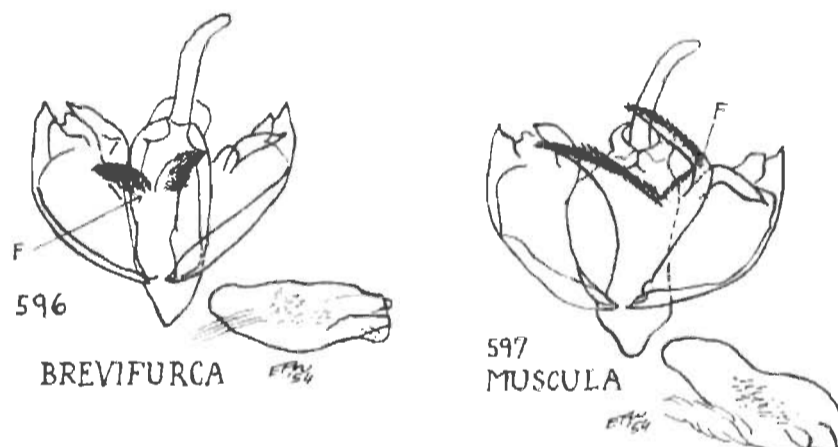


FIG. 1.—Male genitalia, ventral open view, with aedeagus separated, of two *Lithosia* forms: Prep. 596, *muscula brevifurca* ssp. n. (170); Prep. 597, *muscula* Stgr.

Holotype: ♂, IRAQ, Kurdistan, Shaqlawa, 2500 ft., 19.vi.53 (in coll. m.).

Allotype: ♀, same locality, 6.viii.53 (in coll. m.).

Paratypes: 3 ♂ and 1 ♀, same locality: 19 and 20.vi.53, 14.vi.35, 29.viii.35 and 5 ex., 5–17.vi.53 (in coll. m. and Daniel).

171. *Lithosia unita* Hübn. ssp. *hyrcana* Dan.

This species is larger than the preceding and with a straighter costa; the subspecies was described from the Elburz Mts. in Daniel (1939), and in Iraq inhabits the woodland zone of the mountains. For instance, it has been taken at Berserini in November.

The phenology and biology in Iraq have not been recorded. The genus feeds usually on lichens elsewhere.

Anatolian-Iranian, with Euroriental range.

172. *Paidia conjuncta* Stgr. (*bona species*).

Inhabits rocky mountains, especially Middle Heights and is unaffected by deforestation. Feeds on rock lichens. Univoltine, flying from August to October.

Anatolian-Iranian. (The various "forms" of *P. murina* structurally differ and it is no longer possible to regard them all as one species. True *murina* appears to be an Atlantic-Mediterranean species, and ssp. *fuliginosa* Reisser is its Spanish race. In the Middle East no less than three species, namely *albescens* Stgr., *cinerascens* H.-S., and *conjuncta* Stgr. exist. They are distinct from each other both in pattern and aedeagus-armature. *P. cinerascens* H.-S. probably also inhabits Iraq; at least, both it and *conjuncta* inhabit the Southern Zagros (Fars).)

*** 173. *Utetheisa pulchella* L.**

THE CRIMSON-SPECKLED MOTH.

This migrant is widespread and often common in the plains. In the mountains it has been taken at Middle Heights but probably depends on immigration from lower altitudes.

It feeds on heliotrope and is multivoltine. The foodplant, and thus the moth belongs to both oases and desert. It has recently been reported as defoliating cotton in N. Iraq.

Palaeo-tropical, and better able to penetrate the sub-tropics and North Temperate Zone than most of its close relatives, one of which has failed to invade Iraq, though found in Arabia.

174. *Ocnogyna bang-haasi* Stgr.

Inhabits a zone of about 2000-3000 ft. in the mountains (e.g. Diana, Sulaimania).

Univoltine, the male coming to light in March-April. (The female is wingless). Presumably it feeds on low plants.

Anatolian-Iranian.

175. *Ocnogyna loewii* Z.

Widespread in the desert foot-hills, the gravelly steppe-desert of Central and Northern Iraq and also up to considerable heights in the mountains; however it cannot live in alluvial desert.

It feeds on low plants, the larvae being at first gregarious in flat webs on the ground. In April (or May in the mountains) the larva buries to a depth of at least nine inches, in order to pupate. After a long pupal diapause the moth emerges in November-December. The female is wingless.

Anatolian-Iranian, Pan-Eremic.

176. *Volgarctia spectabilis* Tausch.

At Upper Heights in the mountains only.

Univoltine, flying in September. The foodplant is *Salvia* and perhaps other low herbs; the larva was described in Wiltshire (1940, ii).

Anatolian-Iranian.

177. *Axiopaena maura* Eich.

This large black rose-marked moth inhabits the woodland zone.

Univoltine. The foodplant is not recorded. In the Zagros fresh specimens have been taken in May and more chipped ones in July and September-October. It probably aestivates

therefore as an adult. It has been recorded elsewhere as congregating in rock crevices and caverns; reports, therefore, of large masses of moths in the caves of Kurdistan, which geologists sometimes make, probably refer to this moth.

An Anatolian-Iranian species ranging to N.W. India.

177a. *Lacydes semiramis* Stgr.

Inhabits Upper Heights. Univoltine, flying in June. An Anatolian-Iranian high mountain moth.

178. *Arctia hebe* L.

Inhabits Shaqlawa and probably other similar places at Middle heights in the mountains. Univoltine, flying in April–May. Foodplant, not recorded.

Euro-Siberian.

179. *Phragmatobia fuliginosa* L. ssp. *pulverulenta* Alph. (Pl. II, Fig. 28).

Habitat, the same as the preceding. Univoltine, flying in July–August. It feeds on low plants, though not observed to do so in Iraq yet.

Euro-Siberian.

179a. *Phragmatobia placida* Friv.

This larger, darker species flies in early June at Upper Heights. Anatolian-Iranian.

180. *Euplagia quadripunctaria* Poda ssp. *splendidior* Tams. (Pl. I, Fig. 1).

THE GREEN-SHOT JERSEY TIGER.

Inhabits the woodland zone of the mountains.

Univoltine, flying in midsummer. The moths are often seen flying from tree to tree in forests or orchards. The foodplants are low plants in places where there are trees.

This beautiful race is apparently endemic in the Zagros mountains. It extends from N. Iraq to Fars, S.W. Iran. The species is Anatolian-Iranian with Euroriental range.

Family: LYMANTRIIDAE

181. *Leucoma wiltshirei* Collen. (Plate IV, Figs. 18 & 19).

This semi-transparent white moth, described in Collenette (1938), inhabits Middle Heights of Northern Iraq. Until its early stages have been observed it will not be possible to define its status more precisely.

Probably bivoltine. The moth has been taken at Upper Middle Heights in June and at Middle Heights in July–August. Males have been seen flying in morning sunlight over scrub-oak, which may therefore be the foodplant. Both sexes come to light.

Not known yet from outside Iraq.

****182. *Lymantria dispar* L.**

THE GIPSY MOTH.

Inhabits the woodland zone of the mountains.

Feeds on oak (*Quercus*) and poplar (*Populus*). In the woodland zone it seems only found on the former but east of the tree-line, e.g. Hamadan, Central Persia, it feeds on the

latter in high oases. It is univoltine, the larva feeding at night after hatching from the ova in spring. The moth flies in midsummer. Perhaps on account of the aridity this moth is not a serious pest in Iraq, but has been considered such in more humid countries.

Euro-Siberian, now Holarctic after accidental introduction into N. America.

183. *Lymantria destituta* Stgr.

Inhabits the woodland zone of the mountains.

Bivoltine, flying in May and September-October. The foodplant is presumably wild *Prunus* but the larva has not been observed yet.

Anatolian-Iranian.

*** 184. *Lymantria lapidicola* H.-S.**

Inhabits the woodland zone of the mountains, but is scarcer and perhaps less widespread than the preceding.

In the Lebanon the larvae are sometimes pestilential on cultivated almond trees (*Amygdalus communis*). They feed at night, like most of this family. In Iraq it probably feeds on wild *Prunus* and *Amygdalus* bushes, since it has been taken at Rowanduz Gorge, but in other localities where the moth has come to light (e.g. Shaqlawa) it may also feed on apricots and almonds in the orchards. In Iraq the moth appears to be univoltine having only been taken in August-September.

The moth is Anatolian-Iranian, but the Iraqi race is rather smaller and probably less active than the Lebanese race. This appears to be the eastern limit of the species.

185. *Ocneria terebynthina* Stgr.

Inhabits the tree-zone of the mountains.

Bivoltine, flying in June and September. The early stages were described in Wiltshire (1952). The foodplant is wild *Pistacia*.

Anatolian-Iranian.

186. *Ocneria signatoria* Chr. ssp. *poenitens* Stgr.

Widespread in the plains and probably also occurring along river beds in the mountains. Its most usual habitat in the plains is the oases, and in particular the riverside scrub.

The larvae feed nocturnally on *Tamarix* and are gregarious when young. They were described in Wiltshire (1939, i). The moth is bivoltine and flies in April and October. Numbers of those breeding in river-beds are probably drowned in the spring floods but these populations are never quite exterminated. The female flies to light at some distance from the foodplant, while the male is seldom seen except near the tamarisk trees; this sexual behaviour is the reverse of what is usual in most other species.

An Anatolian-Iranian species, with Pan-Eremic range.

**** 187. *Ocnerogyia amanda* Stgr. (Plate I, Figs. 2, 3).**

Inhabits the plains and mountains. In the former it does not reach the extreme south, and is confined to oases, where it defoliates fig-trees in orchards and gardens. In the mountains it doubtless does the same and also feeds on wild fig (*Ficus*).

Bivoltine, flying in April and June-July. The hibernating larvae may be found hidden under dead fig-leaves in orchards, and do not resume feeding before pupating in March.

To control the species, if desired, I suggest a campaign against the hibernating larva in February. The flimsy cocoons are to be seen in masses around the bottom of fig-tree trunks but many of these are empty, being those of previous generations. Details of the larva were given by Buxton (1920). The Chalcid, *Brachymeria intermedia* Nees, parasitises it. The males fly early in the morning and assemble to females which have hatched the preceding night; the males, at least those of the midsummer generation, also sometimes fly by day. The female does not fly until impregnated, but thereafter is sometimes seen at light. August–September moths are also seen and may be a third brood.

Anatolian-Iranian.

188. Porthesia melania Stgr. (Pl. IV, Figs. 27, 28).

Inhabits the woodland zone of the mountains.

The early stages were described in Wiltshire (1943). The larva feeds on *Quercus* and *Prunus* and probably other wild trees and bushes. Univoltine, flying in early June.

Anatolian-Iranian, inhabiting the Zagros scrub wood zone from the Marash area of Turkey (Taurus Mts.) to near Shiraz (S.W. Iran.)

Family: THAUMETOPOEIDAE

* **189. Thaumetopoea solitaria** Freyer.

Inhabits the woodland zone of the mountains.

The larvae feed on *Pistacia* trees, and may be found in small flocks in the forks of the branches, whence, if disturbed, they fall to the ground. Since in N. Iran this larva has been noted recently on cultivated *Pistacia*, it is a potential pest; and it is perhaps fortunate that the existing pistachio-nut orchards in Northern Iraq are far from the stands of the wild trees. The moth is univoltine, flying in September–October.

Anatolian-Iranian.

Family: NOTODONTIDAE

190. Harpyia pulcherrima Brandt.

Described from Fars, S.W. Persia (in Brandt 1938) this rare and pretty moth has recently been rediscovered at Shaqlawa and will doubtless be found to inhabit oases of the Zagros range at Middle and perhaps Upper Heights at many intermediate places.

In Iraq the moth flies in early July. Whether it is univoltine or bivoltine, and what the foodplant is, are still unknown. The latter is probably *Populus* or *Salix*.

Anatolian-Iranian.

191. Harpyia turbida Brandt ssp. *clarior* Wilts.

This moth was described, with an account of the early stages, in Wiltshire (1943), as a pale form of the greyish *Harpyia* which inhabits Fars, S.W. Persia. This pale form has now been taken at Bagdad and Shaqlawa and is presumably a widespread oasis moth of the mountains and the central and northern plains.

Foodplant: *Populus*. Bivoltine flying in spring and midsummer.

Anatolian-Iranian. (The form *clarior* is intermediate between *H. interrupta* ssp. *syra* Gr. Gsh. and *turbida* Brandt. It differs from Lebanese *syra* but resembles some

Anatolian "syra" forms. Its slight pink tinge distinguishes it from the pure white form *leucotera* Stich. from Central and Northern Iran. The midsummer generation near Bagdad is purer white than the spring. These forms might all be regarded as races of *interrupta*.)

192. *Cerura vinula* L. ssp. (?) *intermedia* Teich.

From the North to the very South, in oases.

Foodplants: *Populus* and *Salix*. Bivoltine, flying in spring and early summer.

This race inhabits Iraq and Iran, and is whiter at great heights, greyer below 4000 ft., thereby matching the colour of the trunks of its host-tree. Despite subtle differences from the European form *vinula* (including rather striking differences in the larva) it is perhaps best considered as a subspecies of it. Further examination of the male genitalia of both shows that they do not, after all, differ as suggested in Wiltshire (1946, iii). The larva was described in Wiltshire (1939, ii). Whether the name *intermedia* correctly applies to the Anatolian-Iranian race is perhaps doubtful since it differs from the original description in one particular, namely the ante-medial fascia of the forewing. In the description of *intermedia* this was said to be as in *erminea*, though less curved inside, and doubled. In every other way the local race, particularly the white highland form, agrees with the description, which is why Watkins and Rothschild recorded it as *intermedia*.

Euro-Siberian.

193. *Hoplitis milhauseri* F. subsp. *albida* Dan.

Inhabits the woodland zone of the mountains.

Foodplant: oak (*Quercus*). Flies in mid-April, and probably again in midsummer, though the second generation has not been noted in Iraq.

Euro-Siberian.

194. *Notodonta anceps* Goeze subsp. *korbi* Rebel.

Distributed in Iraq similarly to the preceding, with similar foodplant and phenology.

Euro-Siberian.

195. *Spatalia argentina* F.

Inhabits the woodland zone of the mountains.

Foodplant: oak (*Quercus*). Bivoltine, flying in May and July.

Anatolian-Iranian, with Euroriental range.

196. *Phalera buchephaloides* O. subsp. *syriaca* Zy.

Inhabits the woodland zone of the mountains.

Probable foodplant: oak (*Quercus*); this is, in the Lebanon, its foodplant, as described in Wiltshire (1936, ii). The moth is probably bivoltine, but in Iraq has so far only been seen once, in late August at Shaqlawa.

Anatolian-Iranian, with Euroriental range.

197. *Pygaera pigra* Hufn. ssp. *ferruginea* Stgr.

An oasis moth of mountain and plain, not yet known from the extreme south.

Foodplants: *Populus* and *Salix*. Multivoltine, but without an autumnal generation.

The Anatolian-Iranian race is characterised by its greater number of generations and the paler coloration, in response to the heat, of the second and later broods. The species is Anatolian-Iranian, with Euroriental range.

198. *Sumeria dipotamica* Tams (Pl. II, Figs. 26 and 27).

Described in Tams (1938), this moth now proves to inhabit the oases of the plain of Iraq and to be quite common in Bagdad and Basra town gardens; it also inhabits South Persia.

Efforts to discover the foodplant have not yet succeeded. Larvae from eggs have refused date palm foliage, tamarisk, *Typha*, *Phragmites*, *Zizyphus*, and other likely foliage. The moth is common among date palm trees especially. It is bivoltine, and usually flies in May-June, and September-October.

Anatolian-Iranian, with Eastern Eremic range.

Family: PHALAENIDAE (AGROTIDAE)

199. *Euxoa conspicua* Hübn.

Common in the Northern plain and the mountains, inhabiting both oases and steppe-desert. It also occurs in the southern gravel deserts.

Bivoltine, flying in April-May and September-October. The early stages have not been noted in Iraq but the larvae of this genus are mostly subterranean root-feeders.

Euro-Siberian.

200. *Euxoa temera* Hübn.

Is commonest in North Iraq but reaches at least as far south as Bagdad. In the plain it is restricted to oases, particularly gardens; in the mountains it is more widespread. Univoltine, flying in October.

Anatolian-Iranian, with Euroriental range.

201. *Euxoa nigricans* L.

Inhabits Upper Heights of the mountains.

Univoltine, flying in July-August.

Euro-Siberian.

202. *Euxoa robiginosa* Stgr.

Inhabits Middle Heights in the mountains.

Univoltine autumnal, flying in October.

Anatolian-Iranian.

203. *Euxoa scurrilis* Draudt.

Habitat and phenology, as in No. 201.

An Anatolian-Iranian high mountain species.

204. *Euxoa canariensis* Reb. ssp. *diamondi* Boursin.

Described in Boursin (1940) from a specimen taken in the Southern desert west of Kerbela, this moth is widespread in the southern deserts, except on alluvial ground.

Univoltine, flying in April.

An Anatolian-Iranian moth of Saharan-Sindian range, extending from South Persia to the Canary Islands.

205. *Euxoa inclusa* Corti-Draudt.

Flies at Upper Heights only.

Univoltine, flying in July–August.

An Anatolian-Iranian high mountain species.

206. *Euxoa hilaris* Freyer.

Same habitat, phenology and status as the preceding.

207. *Euxoa vanensis* Draudt.

Inhabits the mountains.

Univoltine autumnal, flying in September.

An Anatolian-Iranian moth.

208. *Agrotis spinifera* Hübn.

Common in oases and widespread throughout Iraq.

Multivoltine. The foodplant is said to be grasses. It probably feeds on the roots of lawn grass, and is certainly common in places with good lawns.

Palaeo-tropical.

**** 209. *Agrotis segetum* Schiff.**

This migratory species occurs throughout Iraq, except perhaps the Shatt-el-Arab tidal date-gardens.

It feeds on stems and roots of low plants, and is in some countries notorious as a pest of root-crops. Multivoltine.

Euro-Siberian.

210. *Agrotis trux* Schiff. ssp. *amasina* Stgr.

Inhabits oases of the Central and Northern Plain and doubtless also the mountains.

Like others of this genus, this moth's larva feeds on roots and stems of low plants. The moth is univoltine, flying and coming to light in October–November.

Anatolian-Iranian, with Eurooriental range.

****211. *Agrotis ipsilon* Hufn.**

This migrant, a pest in many countries, occurs in all types of biotope throughout Iraq.

The larva feeds on roots and leaves of grasses and low herbs and often damages cabbage, beet, lettuce, etc. It is multivoltine. In the plains it often appears commonly at light in the cool weather and as late as May, but disappears in the height of summer. It has not yet been reported as an important pest in Iraq. The moth has a world-wide distribution.

*** 212. *Agrotis exclamationis* L.**

Inhabits the Northern steppe-plain and the mountains.

Bivoltine, flying vernal and autumnally. It feeds on low plants and root-crops.

Euro-Siberian.

213. *Agrotis herzogi* Rebel.

Inhabits the southern and central plain, in oases and deserts. This species was cited in the first edition under its synonym: *hoggari* Roths.

Univoltine autumnal, flying in November. In mild climates it continues to appear until March, apparently a case of extended emergence.

An Anatolian-Iranian moth of Saharan-Sindian range.

214. *Agrotis haifae* Stgr.

Inhabits oases and deserts in Central Iraq, e.g. Bagdad and the foot-hills of the Dyala.

Univoltine autumnal, flying in November.

Anatolian-Iranian, with a more limited eremic range than the preceding. (A third species in this group, namely *A. sardzeana* Brandt is not uncommon at Kuwait and might well be found in the Southern deserts of Iraq in the autumn.)

215. *Agrotis puta* Hübn.

Very common at Middle Heights in the mountains; also inhabits the plain and desert foot-hills of Northern Iraq as far south as the Dyala.

It feeds on low herbs. It is bivoltine, flying in March–April and October–November.

Anatolian-Iranian with Euroriental range.

216. *Agrotis undulata* Goeze (1781) (= *crassa* Hübn. 1808–18) ssp. *golickei* Ersch.

Inhabits Northern Iraq and Central Iraq as far as Amarah. In the plain it seems restricted to oases.

Univoltine autumnal, flying in October–November. The foodplant is said to be grasses.

Anatolian-Iranian of Euroriental range.

217. *Agrotis obesa* B. ssp. *fusca* Corti-Draudt.

Restricted to the mountains, inhabiting the woodland zone.

The larva is said to feed subterraneously on grassroots. The moth is univoltine autumnal.

Anatolian-Iranian.

218. *Agrotis lasserrei* Ob.

Widespread in the plain, and probably in parts of the mountains too.

Univoltine, flying in November.

An Anatolian-Iranian moth with Pan-Eremic range.

219. *Agrotis pierreti* Bugn.

Phenology and status rather similar to the preceding but less common in Iraq; its range seems to be Saharan-Sindian rather than Pan-Eremic.

220. *Pachyagrotis benigna* Corti.

Inhabits the mountains.

Univoltine, flying in October. The early stages were described in Wiltshire (1940, ii); the larva feeds on various low plants.

Anatolian-Iranian.

- 221. *Ochropleura squalorum* Ev.**
 Inhabits Upper Heights in the mountains.
 Univoltine, flying in July–August.
 An Anatolian-Iranian high mountain species.
- 222. *Ochropleura squalidior* Stgr.**
 Has been taken at Sulaf, in the Upper Middle Heights.
 Univoltine, flying in June.
 Anatolian-Iranian.
- 223. *Ochropleura terminicincta* Corti ssp. *phaeotaenia* Bours.**
 Inhabits Upper Heights of the mountains.
 Univoltine, flying in July–August.
 An Anatolian-Iranian high mountain moth.
- 224. *Ochropleura melanura* Koll. ssp. *grisescens* Stgr.**
 Inhabits Upper Heights.
 Univoltine, flying in July–August.
 An Anatolian-Iranian high mountain moth.
- 225. *Ochropleura singularis* Stgr.**
 Inhabits Middle Heights, e.g. Rowanduz Gorge.
 Univoltine autumnal, flying in September–October. The early stages were described in Wiltshire (1943). The larva feeds on various low herbs.
 Anatolian-Iranian, preferring milder climates than the four preceding.
- 226. *Ochropleura hadjina* Stgr.**
 The moth here referred to was listed in the first edition as *forficula* Ev. and inhabits Middle and great heights of the mountains. At Middle Heights, e.g. Shaqlawa, an olive brown form flies in May–June and is f. *zeituna* Stgr. Typical *hadjina* forms, darker blueish in forewing-colouring, have so far only been taken in Iraq at great heights (e.g. at 10,000 ft. on Algard, 3.viii.54).
 Univoltine, usually an early summer moth.
 Anatolian-Iranian. The separation of this species and three others previously all considered forms of *forficula* Ev. also an Anatolian-Iranian moth, is based on small differences of the male genitalia and some other characters.
- 227. *Ochropleura anastasia* Draudt.**
 Inhabits Middle Heights, e.g. Rowanduz Gorge. Scarce.
 Univoltine, flying in September.
 Anatolian-Iranian, inhabiting mountains from Eastern Turkey to Fars (S.W. Persia).
- 228. *Ochropleura flavina* H.-S.**
 Inhabits the Northern plain and the mountains.
 Univoltine, flying in May–June.
 Anatolian-Iranian.

- 229. *Ochropleura nigrescens* Höfn. ssp. *obscurior* Draudt.**
Inhabits Middle Heights, e.g. Shaqlawa.
Univoltine, flying in July.
Anatolian-Iranian.
- 230. *Ochropleura amasina* Tur.**
Same as the preceding, but flying earlier by about a month.
- 231. *Ochropleura wiltshirei* Boursin.**
Inhabits Upper Heights, living in sub-Alpine plant communities.
Univoltine, flying in July.
An Anatolian peak moth, ranging eastwards into the high Persian mountains.
- 232. *Ochropleura celsicola* Bell. ssp. *gracilis* Wagn.**
Inhabits the mountains.
Univoltine, flying in June.
Anatolian-Iranian.
- 233. *Ochropleura stigmatula* Kozh.**
Inhabits Upper Heights in the mountains; scarce.
Univoltine, flying in June–July.
Anatolian-Iranian.
- 234. *Ochropleura signifera* Schiff. ssp. *farsistana* Brandt.**
Inhabits the mountains, e.g. Shaqlawa.
Univoltine, flying in June–July.
An Anatolian-Iranian moth with Euroriental range. The particular race found in Iraq is distributed down the Zagros range into Fars (S.W. Persia).
- 235. *Ochropleura flammatra* Schiff. ssp. *deleta* Koll.**
Inhabits the mountains and both oasis and desert in the Northern plain.
Bivoltine, flying in May–June and October.
Euro-Siberian.
- 236. *Parexarnis taurica* Stgr.**
Rather scarcer than the preceding, but probably with a similar distribution in Iraq; it has so far only been taken in Mosul in one or two autumnal examples.
Probably bivoltine.
Anatolian-Iranian.
- 237. *Eugnorisma coerulea* Wagn.**
Inhabits the woodland zone of the mountains.
Univoltine, flying in October. The early stages of this and the following congeneric moths have not been noted in Iraq; presumably the larvae feed at night on grasses and low plants, like so many Phalaenidae. Full growth is probably attained in spring and the summer passed as a pupa subterraneously.
Anatolian-Iranian.

- 238. *Eugnorisma insignata* Led.**
 Inhabits Upper and Middle Heights in the mountains.
 Univoltine, flying in late August at 6000 ft. and in September–October at Middle Heights.
 Anatolian-Iranian.
- 239. *Eugnorisma semiramis* Boursin.**
 Described in Boursin (1940) this moth inhabits the woodland zone of the mountains without being dependent on tree vegetation.
 Univoltine, flying in October.
 Anatolian-Iranian, with a range down the Zagros to South Persia.
- 240. *Eugnorisma rafidain* Boursin.**
 This moth has only been taken in an oasis biotope in the Central plain. It probably inhabits grassy date gardens and orchards.
 Univoltine, flying in November.
 Anatolian-Iranian, apparently endemic.
- 241. *Eugnorisma pontica* Stgr. ssp. *consenescens* Stgr.**
 Inhabits the woodland zone of the mountains.
 Univoltine, flying in September–October.
 Anatolian-Iranian.
- 242. *Rhyacia lucipeta* Schiff.**
 Inhabits Middle Heights, but is not common.
 Univoltine, flying in May.
 Anatolian-Iranian, with Euroriental range.
- 243. *Rhyacia nyctimerides* B-H. (*bona* sp.)**
 An inhabitant of hilly steppe country and high mountains, not very common in Iraq.
 Univoltine, flying in June–July.
 Anatolian-Iranian.
- 244. *Chersotis semna* Püngl.**
 Inhabits great heights in the mountains.
 Univoltine, flying in June–July.
 An Anatolian-Iranian peak moth.
- 245. *Chersotis fimbriola* Esp. ssp. *zernyi* Cti.**
 Inhabits Upper Heights of the mountains, appearing in great numbers.
 Univoltine, flying in June–July.
 Anatolian–Iranian, with Euroriental range.
- *246. *Triphaena pronuba* L.**
 THE LARGE YELLOW UNDERWING.
 This somewhat migratory and, in some countries, often destructive moth, has been noted in oases of the central plain, in the desert foot-hills of the Dyala province and in the

stony desert west of Kerbela in February and April; it doubtless also inhabits the mountains.

The phenology of this moth in Iraq requires elucidation. The larva feeds on low plants and sometimes garden vegetables.

Euro-Siberian.

246a. *Triphaena comes* Tr.

Inhabits Upper Heights.

Univoltine, flying in June; the larva, which hibernates, feeds on low herbs in autumn and spring.

Anatolian-Iranian, with Eurooriental range.

247. *Triphaena ianthina* Esp.

THE LESSER BROAD-BORDERED YELLOW UNDERWING.

Occurs rather scarcely in the woodland zone, in oases.

Univoltine, flying in June–July. Feeds on low plants.

Anatolian-Iranian, with Eurooriental range.

247a. *Eicomorpha koeppeni* Alph.

Flies at Upper Heights in early June. Anatolian-Iranian.

248. *Amathes xanthographa* Schiff.

Inhabits the woodland zone and oases in the plain as far south as Bagdad. In the latter it inhabits grassy orchards.

Univoltine, autumnal, flying in October–November. The larva feeds throughout the mild winter of the plains on low plants, especially grasses, at night, and spends the summer in a subterranean cocoon among grass-roots.

Anatolian-Iranian, with Eurooriental range, to Britain in the North-West and to Fars (S.W. Iran) in the south-east. It is distinguished from the two following rather similar moths by male genitalia and larval pattern.

249. *Amathes cohaesa* H.-S. (= *pulverea* Hamps.)

In the Middle East this moth accompanies the preceding in its various habitats.

Its phenology is similar to that of the preceding. The differences between the larvae were shown in Wiltshire (1952).

An Anatolian-Iranian moth, extending less far to the North-west than the preceding.

250. *Amathes palaestinensis* Kalch.

Inhabits Middle Heights in the mountains. Its phenology is similar to the two preceding but its early stages have not yet been accurately observed.

Anatolian-Iranian, less widespread than the two preceding, and apparently at its eastern limit in N. Iraq.

251. *Discestra trifolii* Hufn. (*taylori* Roths.)

Occurs from North to South of Iraq, inhabiting oases, desert and various mountain biotopes.

Multivoltine, feeding on *Atriplex* and *Chenopodium* and probably other herbs.

Holarctic.

252. *Cardepia albipicta* Christ.

This moth, which was erroneously listed in the first edition as *Discestra arenaria* Hamps., inhabits the southern and central plains of Iraq, and breeds both in oases and deserts.

The early stages were described in Wiltshire (1940); the foodplant is *Atriplex* and probably other saline desert plants. Bivoltine, flying in April–May and October.

Anatolian-Iranian, with Eremic range, probably a halophile species.

253. *Hadula pulverata* B.-H.

This species flies in February in the deserts around Kuwait, and probably the southern deserts of Iraq. Rothschild recorded "*Scotogramma chimaera* Roths." from Bagdad in October. Since the type of *chimaera* Roths. from N. Africa, on inspection by Boursin, proved to be a *Hadula*, the specimens from Iraq which Rothschild thus determined and which I have not seen, may well be this same species, which may be bivoltine.

254. *Mamestra oleracea* L.

In the mountains and in the plains, as far south as Bagdad. In the plains it seems restricted to oases.

It feeds on *Atriplex*, *Chenopodium* and other low plants. In the plain the second generation's larvae do not hibernate but pupate in November–December. The moth is bivoltine, flying in April–May and August–October.

Euro-Siberian.

255. *Mamestra corsica* Ramb. ssp. (?) *leuconota* Ev.

Inhabits the Upper Heights of the mountains.

The larva has not been observed in Iraq but probably feeds on *Compositae* flowers and seeds, as does that of its close relative *bicolorata* Hufn. (= *serena* Schiff.)

Probably univoltine; this form flies in high oases and mountain country in the Zagros range in June–July.

An Anatolian-Iranian moth with a rather southerly Euroriental range. The species *corsica* was recently separated by Boursin from *bicolorata* on genitalia characters, and has now been discovered in Asia, viz. in Jordania (where the grey Mediterranean forms fly) and in the Zagros range where a snow-white forewinged form, resembling the typical *bicolorata*, flies. Its genitalia however show clearly that it belongs rather to *corsica*. It may be permissible to use Eversmann's name *leuconota* for the Zagros form, but investigation of the Ural Mountains races is first necessary.

256. *Mamestra dysodea* Schiff.

Inhabits the mountains, and the oases of the plain as far south as Bagdad, where the form *innocens* Stgr. prevails.

It feeds on *Lactuca scarioloides* and perhaps other *Compositae*. In the plain it is bivoltine, flying in May and November. In the mountains larvae found in June produced moths in July, and whether there is a second brood is not yet known.

Anatolian-Iranian, with Euroriental range.

257. *Mamestra rhodocharis* Brandt ssp. *herkia* subsp. n. (Plate I, Fig. 19).

In the typical form from Fars (Fig. 18) the rosy and yellow colours prevail sufficiently to have inspired the author to name the species accordingly; but in this more northerly race (Fig. 19) the grey suffusion is so heavy in most examples that the general impression given is that of a sooty grey moth. The forewing can be described as sandy grey more or less suffused with fuscous and blackish; the markings are variable. In the lighter colour forms, which are rare, the ochreous almost orange sandy ground-colour is visible around the stigmata and fringes and, interrupted, along the fasciae. More often the whole wing is obscured.

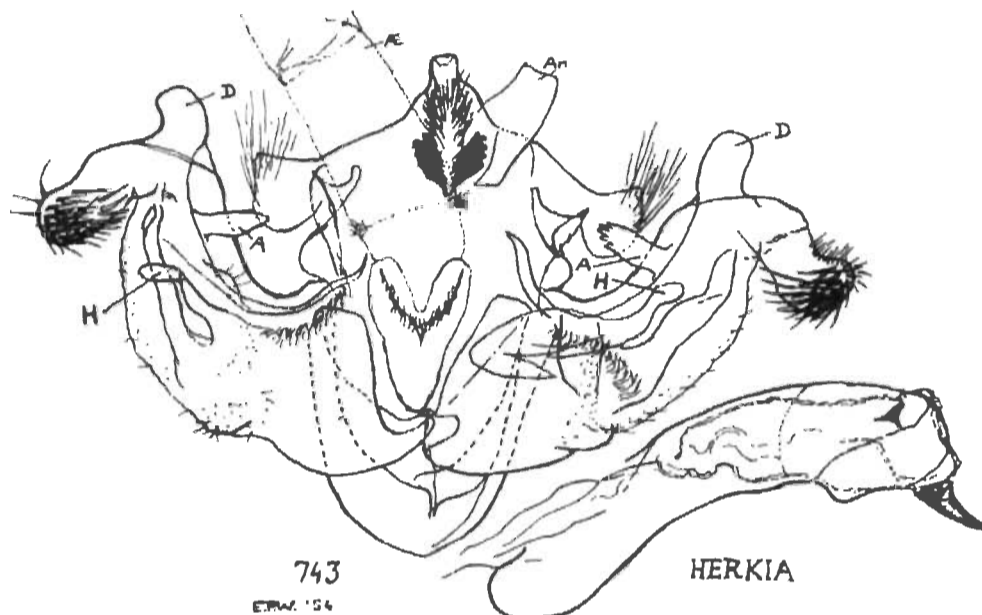


FIG. 2.—Male genitalia, ventral open view, with aedeagus separated, of *Mamestra rhodocharis* Brandt *herkia* ssp. n. (257). (Ae = sheath of aedeagus; An = Anus; A = ampulla; D = digitus; H = harpe.)

The types of this new race were taken in numbers to light in late and July early August 1954 at Hajji Omran and are in my collection. The male genitalia are here illustrated (Text-fig. 2).

An Anatolian-Iranian high mountain moth.

257a. *Hadena lepida* Esp. ssp. *capsophila* Boisd.

Flies at Upper Heights in early June.

Foodplant: flowers and fruits of *Silene* and relatives.

Euro-Siberian.

257b. *Hadena luteago* Schiff.

Flies at Upper Heights in early June.

Foodplant: roots and stems of *Silene* and relatives.

Euro-Siberian.

257c. *Hadena gueneei* Stgr.

Flies at Upper Heights in early June. Anatolian-Iranian.

258. *Hadena luteocincta* Ramb. ssp. *tristis* Draudt.

Flies in July at Upper Heights, in one brood. An Anatolian-Iranian high mountain moth.

259. *Hadena melanochroa* Stgr.

Same remarks as the preceding. Flies in June–July.

260. *Hadena compta* Schiff.

Flies in July at Upper Heights, univoltine. Elsewhere this moth feeds on flowers of the Pink Family (Caryophyllaceae), and this is doubtless the case in Iraq.

Euro-Siberian.

261. *Hadena bicruris* Hufn.

Flies at Upper Middle Heights and higher.

Feeds on *Lychnis vespertina*, eating the flowers and seeds. The habit and the flower are the same in Iraq as in Europe. Bivoltine, but the second generation is partial. The moth flies in May–July.

Euro-Siberian.

262. *Hadena avempacei* Tams. (= *Calophasia pampaninii* Krug.)

Inhabits the southern deserts, e.g. west of Kerbela.

Univoltine, flying in March–April.

Anatolian-Iranian, with an Eremic range into the Sahara.

262a. *Euterpia laudeti* Boisd.

Flies at Upper Heights in June. Foodplants: *Silene* and *Gypsophila*.

Anatolian-Iranian, with Euroriental range.

263. *Pronotestra silenides* Stgr.

Widespread in the desert, especially the south.

Univoltine, flying in February–March.

Anatolian-Iranian, with a Saharan-Sindian Eremic range.

264. *Xylomiges conspicillaris* L.

Very common to light at Middle Heights. Flies in mid-April, univoltine. Polyphagous.

Euro-Siberian; in the Middle East it is found down the Zagros into Fars, and also inhabits the Elburz range near Tehran.

265. *Orthosia* (?) *cruda* Schiff.

Inhabits Middle Heights of the mountains.

Univoltine, flying in mid-April. Feeds on foliage of various trees and shrubs; oak (*Quercus*), hawthorn (*Crataegus*), etc.

Males have not yet been taken and there is therefore some doubt as to whether this may not be the similar species *O. schmidtii* Diosz., which is chiefly distinguished by male genitalia. While *cruda* is Euro-Siberian, the other is probably Anatolian-Iranian.

- 266. *Orthosia incerta* Hufn.**
Inhabits Middle Heights of the mountains. Feeds elsewhere on various trees and in Iraq probably feeds on oak (*Quercus*). Univoltine, flying in April.
Euro-Siberian.
- 267. *Orthosia rorida* Friv. ssp. *sieversii* Chr.**
Inhabits Middle Heights of the mountains.
Univoltine, flying in April.
Anatolian-Iranian.
- 268. *Perigrapha cilissa* Püng.**
Inhabits Middle Heights of the mountains.
Univoltine, flying in April.
Anatolian-Iranian.
- 269. *Mythimna ferrago* F. (= *lythargyria* Esp.) ssp. *argyritis* Ramb.**
Inhabits Middle Heights of the mountains.
Univoltine, flying in September–October. It feeds on grasses at night, attaining full-growth in spring.
Euro-Siberian.
- 270. *Mythimna vitellina* Hübn.**
Widespread and common in the mountains.
Probably bivoltine in Iraq. Foodplant: grasses.
Euro-Siberian.
- 271. *Mythimna l-album* L.**
Inhabits Middle Heights of the mountains.
Foodplant: grasses. Bivoltine, flying in June–July and again in autumn.
Euro-Siberian.
- 272. *Mythimna congrua* Hübn. (Pl. IV, Fig. 13).**
Inhabits Middle Heights and oases of the plain such as Bagdad.
Foodplant: grasses. The larvae which reach full growth in the spring rest, unlike No. 269, only a short time as pupae before the moth emerges in April; the life-cycle has, however, not been followed through the latter half of the year; one presumes the moth is bivoltine.
Anatolian-Iranian, with an Euroriental range.
- 273. *Mythimna alopecuri* B. subsp. *syriaca* Osth. (Pl. II, Fig. 24).**
Inhabits the woodland zone, of the mountains.
It probably feeds on grasses. Bivoltine, flying in May and September–October.
Anatolian-Iranian, with Euroriental range.
- 274. *Mythimna punctosa* Tr. (Pl. IV, Fig. 9).**
Inhabits Middle Heights and suitable oases of the north and central plain.
Feeds on grasses. Probably bivoltine, flying in early summer and autumn.
Anatolian-Iranian.

275. *Mythimna herrichii* H.-S. (Pl. IV, Fig. 10).

Inhabits the woodland zone of the mountains.

Univoltine, flying in October.

Anatolian-Iranian.

***276. *Mythimna zaeae* Dup. (Pl. IV, Figs. 11, 12).**

Inhabits oases of the plain, such as Bagdad, and doubtless also occurs in the mountains. Feeds on grasses, also cereal crops. Probably bivoltine.

Anatolian-Iranian.

277. *Mythimna languida* Stgr. (= *Borolia sesamiodes* Hamps.) (Pl. II, Fig. 25).

Inhabits oases of the central and southern plain.

Phenology and life-cycle not yet completely known; it appears in early summer but may well be bivoltine. Its larva, like others of this genus, doubtless feeds on *Gramineae* and perhaps cereals too.

An Anatolian-Iranian moth with a more Eremic range than the preceding two or three species, ranging from South Persia into North Africa in hot oases.

***278. *Mythimna loreyi* Dup. (Pl. IV, Fig. 14).**

Probably a migrant, this moth occurs throughout Iraq. In the desert it may well be no more than a stray, breeding in the oases. In the mountains it reaches Upper Heights in midsummer, and may even breed there.

It feeds on *Gramineae* of various sorts, and is multivoltine. Rao reported it as feeding on *Sorghum*. The larva is a night-feeder and very averse to light.

Its range is practically world-wide.

(The above *Mythimna* species, especially Nos. 272–278, are often confused both with each other and with similar species in other genera. The Plates II and IV may help readers to sort the Iraqi "Wainscot" moths out. The name "Wainscot" is given to moths with this pattern of forewing; it is a visual adaptation to the grassy biotopes which they inhabit. The genus *Mythimna* (= *Leucania* of many authors) being in the sub-family *Hadeninae*, all of which have hairy eyes, may be distinguished from the smooth-eyed "wainscot" moths, also shown in the plate, if the eyes are examined under a magnifying glass; the male genitalia are also characteristic. *Mythimna* larvae are striped and feed externally on grasses; this habit is different from that of the smooth-eyed wainscot moths, which are listed below (Nos. 381–386).)

279. *Brachygalea albolineata* Blach.

Has been taken at Bagdad, i.e. oasis terrain, but probably is a stray from desert vegetation.

Univoltine, flying in March.

Anatolian-Iranian, with an Eremic range into the Sahara.

280. *Cucullia boryphora* F.-W.

Inhabits the desert west of Kerbela and doubtless most of the southern deserts.

Univoltine, flying in March–April.

Anatolian-Iranian, Eremic.

281. *Cucullia wredowi* Costa.

Widespread in the plain, inhabiting both stony and alluvial deserts and oases; probably also penetrating the mountains to Middle Heights.

Univoltine, flying in February–March. The gaily variegated larva may be found by day on *Calendula* and closely-related *Compositae*.

Anatolian-Iranian Eremic, closely related to the European *chamomillae*.

282. *Cucullia barthae* Boursin.

Inhabits Middle and probably also Upper Heights of the mountains, especially on limestone terrain.

Feeds on *Scrophularia* by day. The dorsal pattern of the larva of this and the next three species is an easier character for distinguishing them than the adult moth's wing pattern. (See Fig. 3.) Univoltine, flying in April.

Anatolian-Iranian, on limestone mountains from N. Iran to Cyprus, perhaps further west.

283. *Cucullia lychnitis* Ramb.

Inhabits the mountains, perhaps also the northern plain.

Feeds on *Verbascum* and *Celsia* by day. Univoltine, flying in May.

Anatolian-Iranian, with Euroriental range.

284. *Cucullia strigicosta* Boursin. (Pl. IV, Fig. 30).

Inhabits the desert foot-hills of Iraq, e.g. Injana and Jebel Darawishka. Described in Boursin (1940).



FIG. 3.—Diagrams of black dorsal and right lateral markings of 6th somite of *Cucullia verbasci* group larvae in Iraq: (i) *barthae* Bours. (282), (ii) *strigicosta* Boursin (284), (iii and iv) *verbasci* L. (285), and (v, vi, and vii) *lychnitis* Ramb. (283).

Feeds on *Scrophularia* by day in March–April, and passes the months May–January in a deep subterranean cocoon. Univoltine, flying in February–March.

Anatolian-Iranian, Eremic, extending into the Eastern desert of Egypt and Sinai; probably localised, as its food-plant is also rather local.

285. *Cucullia verbasci* L. (Pl. IV, Fig. 31).

Local in the Central plain (e.g. Tamim and Abu Ghuraib) and probably also inhabits the Northern plain and mountains.

Feeds on *Scrophularia*, *Celsia* and *Verbascum* elsewhere, but probably in Iraq is specially dependent on *Verbascum*. It prefers some species of this genus to others, for I have looked in vain for the larvae on the widespread *V. sinuatum* in the mountains. Another species,

Verbascum tripolitanum, grows among barley-cultivation at Tamim, and this colony doubtless supports the moth population from which wanderers sometimes appear at light at Abu Ghuraib. The moth is univoltine, flying in February in the central plain; in the mountains and Northern plain it should fly in March.

Euro-Siberian.

285a. *Calophasia casta* Borkh.

Flies at Upper Heights in early June.

Anatolian-Iranian, with Euroriental range.

286. *Copiphana gafsana* Blach.

Inhabits the desert west of Kerbela.

Univoltine, flying in March.

Anatolian-Iranian, with a Saharan-Sindian Eremic range.

287. *Cleophana opposita* Led.

Common at Middle Heights of the mountains.

Univoltine, flying in April–May.

Anatolian-Iranian.

288. *Cleophana pectinicornis* Stgr.

Common in desert foot-hills in Central and Northern Iraq and penetrating Middle Heights to some extent.

Univoltine, flying in March.

Anatolian-Iranian Eremic.

289. *Cleophana jubata* Ob.

Inhabits the stony deserts.

Univoltine, flying in March–April.

Anatolian-Iranian, Eremic (Saharan-Sindian).

290. *Cleophana chabordis* Ob.

Widespread in the plain, not very numerous. Turns up in the desert and in oases.

Univoltine, flying in April–May.

Anatolian-Iranian, Eremic (Saharan-Sindian).

291. *Cleophana boetica* Ramb. ssp. *diluta* Roths.

Widespread in the stony deserts, also quite common up to Middle Heights in the Mountains.

Univoltine, flying in March–April. The foodplant elsewhere is said to be *Helianthemum*.

Anatolian-Iranian, extending westwards to Spain and N.W. Africa.

292. *Omphalophana antirrhini* Hübn.

Occurs at Middle Heights of the mountains; scarce.

Univoltine, flying in May.

Anatolian-Iranian, with Euroriental range.

292a. *Omphalophana anatolica* Led.

Inhabits foot-hills of the Dyala Liwa and doubtless other steppe-deserts of Northern Iraq.

Univoltine, vernal.

Anatolian-Iranian.

293. *Metalopha gloriosa* Stgr. (Pl. I, Fig. 21).

Flies in April at Middle Heights.

Univoltine, Anatolian-Iranian.

294. *Metalopha liturata* Christ. (Pl. I, Fig. 20).

Flies at Middle Heights and probably also in the Northern plain on steppe-désert terrain.

Univoltine, flying in April.

Anatolian-Iranian.

295. *Metopoceras omar* Ob.

Widespread in the desert, whether stony or alluvial; it also inhabits oases, though in smaller numbers.

Bivoltine, both generations being vernal; March and April–May. The second generation is paler than the first.

Anatolian-Iranian, Saharan-Sindian.

296. *Metopoceras delicata* Stgr.

Widespread in the desert, on both stony and alluvial ground; occasionally occurs in oases of the plain also.

Bivoltine, with one vernal and one autumnal brood; April–May and October–November.

Anatolian-Iranian, Ercmic.

296a. *Metopoceras beata* Stgr.

Flies at Upper Heights in June. Anatolian-Iranian.

297. *Lithophasia quadrivirgula* Mab.

Inhabits desert foot-hills in the Dyala province and is doubtless widespread in the other deserts of Iraq.

(?) Univoltine autumnal, flying in November.

Anatolian-Iranian, Saharan-Sindian.

297a. *Lithophasia cyaxares* sp. n. (preliminary description).

Flies at Upper Heights in June. Anatolian-Iranian.

The buff forewing is streaked with dark brown below the cell, the brown streak itself being edged with a pure white blackish-edged arrow-shaped streak along v.2 from its origin to about 2 mm. from the tornus. The other nervures are dark brown and white-edged submarginally, terminating in white tips on the fringes, v.6 being the most conspicuously so.

In its broader wing-shape this new species comes closer to *venosula* Stgr. than *quadri-virgula* Mab. From the latter, the brighter colouring, more striate pattern, and longer cornuti in the aedeagus distinguish it.

Types, holotype ♂, and allotype ♀, 2-13.vi.56, Haj Omran near Rayat. (in coll. m.).

298. *Oncocnemis confusa* Freyer.

Inhabits the mountains.

Flies in October at Shaqlawa, a few weeks earlier at greater heights.

Euro-Siberian.

299. *Bryomima carducha* Stgr.

Inhabits Middle Heights of the mountains.

Flies in June-July, probably univoltine. The species is rather scarce and little is known about it.

Anatolian-Iranian.

300. *Derthisa lederi* Christ.

Inhabits Middle Heights and inhabits also the desert foot-hills zone of the Dyala province.

The foodplant has not yet been observed in Iraq, but is presumably some bulbous squill-like plant, as the genus is addicted to *Liliaceae*. Univoltine, flying in October-November.

Anatolian-Iranian.

301. *Metopodicha ernesti* Draudt.

Although the type of *ernesti*, from the Taurus mountains, is lost, there seems no doubt of the identity of this moth which inhabits the woodland zone of the Iraqi mountains. Its genitalia agree with those of *Metopodicha* (= *Persidia*, Wilts., 1946, iii) (*syn. nov.*) *achaemenica* mea, which is the Fars race of this species and is larger and usually more clearly marked.

Univoltine, flying in October.

Anatolian-Iranian.

302. *Leucochlaena muscosa* Stgr. (= *rasilis* Draudt).

Inhabits the woodland zone of the mountains.

Univoltine, flying in October. The larva, which was described in Wiltshire (1943) feeds on low plants.

Anatolian-Iranian.

303. *Aporophyla ingenua* Freyer ssp. *dipsalea* Wilts.

Inhabits desert foot-hills of the Dyala province and presumably other parts of Northern Iraq.

Univoltine, autumnal flying in October-November. The larva feeds on low plants and is full-grown in spring; summer is spent in pupal diapause underground.

Anatolian-Iranian.

304. *Evisa schawerdae* Reisser ssp. *kurdistana* Boursin.

This race was described in Boursin (1940). The moth inhabits the woodland zone of the mountains.

Univoltine, flying in October. Probable foodplant: *Quercus*, oak; or perhaps *Crataegus*, hawthorn.

Anatolian-Iranian with Mediterranean range, extending to Corsica and N.W. Africa.

305. *Lithophane semibrunnea* Haw.

Inhabits the woodland zone of the mountains, and particularly oases.

The foodplant elsewhere is known to be ash foliage (*Fraxinus*), and in Iraq is probably the same. Ash trees grow luxuriantly in the oasis biotope (Shaqlawa) where it was captured. Nevertheless the tree is not purely an oasis species in the Iraqi-Iranian mountains, a smaller species growing unirrigated in the Zagros woods. It remains to be seen how widespread in these mountains the moth really is. It is univoltine autumnal-vernal, for the adult moth hibernates and reproduces itself in the spring.

Anatolian-Iranian, with Euroriental range.

306. *Lithophane ledereri* Stgr. subsp. *discors* Stgr.

This species was taken together with the preceding at Shaqlawa in April; its status is more obscure since its foodplant has not been observed anywhere. It probably feeds on some kind of tree. The phenology is doubtless similar to that of the preceding.

Anatolian-Iranian.

***307. *Xylena exsoleta* L.**

The only record of this moth from Iraq is still that of Rao who found the larvae on *Vicia faba* in March 1920 at Karrada Farm; he considered it a pest. This particular colony of the moth seems to have disappeared. It is doubtful if it will be a serious pest.

Univoltine, autumnal-vernal. The moth hibernates when sexually immature, and mates in April in Europe; in Iraq it presumably does so earlier, probably February–March in the plain, and April in the mountains, which it doubtless inhabits. After a long pupal diapause in the summer, the moth emerges in October–November.

Euro-Siberian.

308. *Xylocampa areola* Esp.

Inhabits Middle Heights of the mountains.

Univoltine, flying in April. Foodplant: *Lonicera*.

Anatolian-Iranian, with Euroriental range.

309. *Allophyes* sp.

Inhabits the woodland zone.

Univoltine, autumnal. Foodplant: *Prunus* and probably also *Crataegus*. Adults have not yet been reared from larvae found in Kurdistan, so one cannot name the species with certainty. It is probably either *A. metaxys* Boursin (which flies in the Taurus mountains) or *A. renalis* Wilts., which flies in the South Zagros and also Transcaucasia.

310. *Synvaleria oleagina* Schiff. ssp. *syriaca* Osth.

Inhabits Middle Heights of the mountains.

Univoltine, flying in April.

Anatolian-Iranian with Euroriental range.

311. *Dryobotodes protea* Schiff. ssp. *incolorata* Warr.

Inhabits the woodland zone of the mountains.

Univoltine, autumnal Foodplant: oak (*Quercus*).

Anatolian-Iranian, with a wide Euroriental range westwards to the British Isles and south-eastwards with the oak-tree into Fars, S.W. Iran.

312. *Antitype canescens* Dup.

Inhabits Middle Heights of the mountains and probably also desert foot-hills and the northern plain.

Univoltine autumnal, flying in October. The larva feeds polyphagously on various low herbs, especially *Calendula*.

Anatolian-Iranian, with a Mediterranean range.

313. *Antitype carducha* sp. n. (Pl. IV, Fig. 15).

Inhabits Middle Heights of the mountains.

Univoltine, vernal, flying in April in Iraq. It is probably polyphagous on low plants. Anatolian-Iranian, inhabiting the length of the Zagros range, as appears from the details after the description below:

Male antenna, bipectinate.

Thorax and forewing ground colour pale grey to ochreous grey, more or less heavily powdered or suffused with fuscous. Basal and ante-medial fasciae absent. Orbicular stigma sub-quadrate, pale-edged, separated by a small dark space from the similar but slightly larger reniform stigma; both stigmata appear rather large and vaguely defined, the reniform being without a clear upper or lower pale border, and the orbicular also, in some cases, being similar. The small dark space between them is joined above the orbicular with a dark costal spot, and continues downward across the wing as a narrow medial shade, clearest in the pale specimens, and reaching in them the hind-margin close to the post-medial fascia. Post-medial fascia denticulate, fine, with sharp blackish points on the nervures. Submarginal area paler. A series of vague sub-terminal pale crescents appear in some specimens close to the termen, which is fine and grey. Fringes pale ochreous basad, darker grey at tips. Hindwing dirty white, more or less suffused with fuscous; in the whiter specimens the cell-spot and post-medial fascia appear more clearly. Nervures and termen darker. Fringes as on forewing. Underside forewing, greyish, nervures other than the cubital suffused with fuscous. Span: 35-37 mm.

Male genitalia (see Text-fig. 4, prep. 633): uncus cygnate. Valve with normal costa, of sub-rectangular form, the costal corner truncate, the ventral corner pointed; sacculus divided into a heavily sclerotised triangular basal section and an almost separate distal narrower section from which a harpe or slender sclerotised arm projects across the costa. Juxta broader than long, saddle-shaped. Aedeagus with three small cornuti in the vesica and a toothed distal ventral edge; its sheath is cylindrical and can be peeled back to a certain extent.

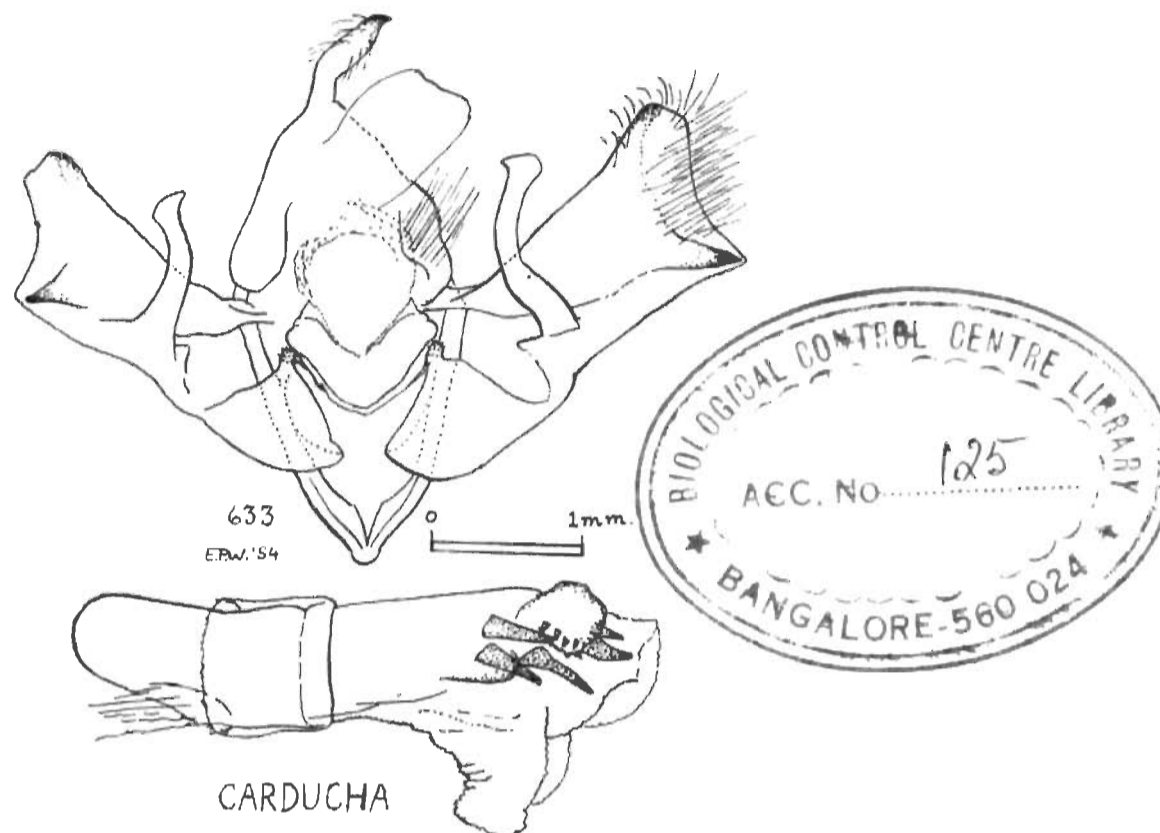


FIG. 4.—Male genitalia, ventral open view, with aedeagus separated, of *Antitype carducha* sp. n. (313).

Holotype ♂ and paratypes, six ♂♂:—IRAQ, Kurdistan, Shaqlawa, 2500 ft., 7–11 .iv .53 (in coll. m. and Boursin).

Allotype: ♀, IRAN (PERSIA), Fars, Darab plain, 4000 ft., 26 .ii .50 (in coll. m.).

314. *Eumichtis johanna* Stgr. (= *Catamecia buxtoni* Roths.)

Inhabits the Southern plain, e.g. Ali as Sharqi, and Kumait.

Univoltine, flying in November.

Anatolian-Iranian, probably with an Eremic tendency, perhaps an oasis moth.

315. *Xanthia croceago* Schiff.

Inhabits the woodland zone of the mountains.

It has been taken in mid-April at Shaqlawa to light. It is univoltine, hatching from the pupa in autumn, and then hibernating. Foodplant: oak (*Quercus*).

Anatolian-Iranian with Euroriental range.

316. *Conistra veronicae* Hübn.

Inhabits the woodland zone of the mountains.

Univoltine, the moth emerging in autumn, then hibernating, and reappearing in April.

Anatolian-Iranian, with Euroriental range.

317. *Agrochola scabra* Stgr.

Inhabits the woodland zone in the extreme north of Iraq, e.g. Duri, but may be more widely distributed in the mountains.

Univoltine, flying in November. Probable foodplants are various low herbs.

Anatolian-Iranian.

(It seems likely that *A. lychnidis* F. also inhabits the mountains; it is an Anatolian-Iranian moth with Euroriental range and reaches Fars.)

317a. *Agrochola* sp.

Probably a new species, this univoltine autumnal moth inhabits Upper Heights; the larva feeds in flowers of *Eremostachys laciniata* in June.

318. *Simyra dentinosa* Freyer.

Inhabits the mountains, whether wooded or bare, and perhaps parts of the Northern plain.

Univoltine, flying in April. The bristly, black and yellow caterpillars feed on spurge (*Euphorbia*) and are gregarious in webs when young.

Anatolian-Iranian.

***319. *Apatele rumicis* L.**

Inhabits the mountains, especially oases.

Polyphagous, sometimes feeding on fruit-trees such as plum (*Prunus*), also on water-mint and various herbs; it is probably of no economic importance. Bivoltine, flying in a vernal and a late summer brood.

Euro-Siberian.

***320. *Apatele aceris* L. ssp. *johanna* Schaw.**

Inhabits oases of the plain, without reaching the extreme south; doubtless also inhabits the mountains.

Foodplant: Poplar (*Populus*), both the cultivated kind and the wild river-tree, *P. euphratica*. Bivoltine, flying in April–May and October, and the larva feeding up quickly during the month after the parents' flight. The showy, tufted caterpillars are often the victims of an apantelid fly whose cocoons are sometimes conspicuous on poplar leaves.

Euro-Siberian.

321. *Craniophora pontica* Stgr.

Inhabits oases of the mountains.

Flies in July–August, probably a second generation. Probable foodplant: ash (*Fraxinus*).

Anatolian-Iranian.

322. *Cryphia algae* F.

In rocky places in the mountains.

Univoltine, flying in early autumn. The foodplant of the whole genus is rock-lichen (*Algae*), and, although the larvae of this and the following five species have not been bred up in Iraq, it is reasonable to suppose that all feed on this pabulum.

Anatolian-Iranian, with Euroriental range.

323. *Cryphia raptricula* Schiff. (= *divisa* Esp.)

Inhabits the mountains and Northern plain.

Bivoltine, flying in May–June–July and September.

Euro-Siberian.

- 324. *Cryphia rectilinea* Warr.**
 At Middle Heights in the mountains.
 Univoltine, flying in early autumn.
 Anatolian-Iranian.
- 325. *Cryphia moeonis* Led.**
 Inhabits Middle Heights of the mountains.
 Univoltine, flying in June–July.
 Anatolian-Iranian.
- 326. *Cryphia eucharista* Boursin (= *iranica* Brandt).**
 Inhabits Middle Heights of the mountains. First described in Brandt (1941, i).
 Univoltine, autumnal. Anatolian-Iranian.
- 327. *Cryphia tabora* Stgr.**
 The habitat, phenology and status are as in the preceding species.
- 328. *Apopetes spectrum* Esp.**
 Inhabits the Northern plain and the mountains.
 The foodplant in Iraq has not yet been observed; in the Lebanon it is the Spanish broom (*Spartium junceum*) but this cannot be the foodplant in Iraq, as it is only grown in a few gardens. The probable foodplant is liquorice (*Glycyrrhiza*) on which I have noted cocoons of the related *Apopetes* species near Tehran. This plant is widespread in Iraq. The moth emerges in September, except in the high mountains where it hatches in July. In December after a long spell of activity the large moths congregate in caves and also in houses and cellars. Many die during hibernation but presumably the eggs are laid in spring by the surviving females. The moth, thus, is univoltine, with a phenology not yet entirely understood.
 Anatolian-Iranian, with a rather Mediterranean range. (The Iraqi moth's identity with the Mediterranean species has been confirmed from the male genitalia and general aspect. The two closely-related species with a more easterly range have not yet been found in Iraq, but might be discovered eventually.)
- 329. *Tathorhynchus exsiccata* Led.**
 The sporadic appearances of this moth, chiefly in the plain, and equally in oasis or desert, suggest that it is a migrant. Very little, however, is known about it.
 Holo-tropical penetrating the sub-tropics.
- 330. *Autophila asiatica* Stgr.**
 Inhabits Middle Heights of the mountains.
 Univoltine, flying in April.
 Euro-Siberian.
- 331. *Autophila limbata* Stgr.**
 Inhabits Middle Heights of the mountains and also the northern plain.
 Flies commonly in April at Middle Heights, but a specimen has also been taken in June in the steppes near Mosul. This suggests the species is bivoltine.
 Anatolian-Iranian.

332. *Autophila cerealis* Stgr. ssp. *amseli* Draudt.

Widespread in the deserts and mountains.

It feeds on *Salvia* and perhaps other low herbs. Probably bivoltine, with the two broods flying in spring and early summer.

Anatolian-Iranian, with an Eremic range from Egypt to Central Asia.

333. *Autophila ligaminosa* Ev. ssp. *rhodochroa* Boursin.

Inhabits the mountains.

Bivoltine, flying in June and August–October.

Euro-Siberian.

334. *Autophila cymaenotaenia* Boursin ssp. *orthotaenia* Wilts.

Inhabits the desert of the south, as far north as the latitude of Kerbela at least.

Bivoltine, flying in May and October towards its northern limit, the two broods tending to approach one another in winter further south.

Anatolian-Iranian with Eremic range westwards into N. Africa.

335. *Amphipyra pyramidea* L.

Inhabits the mountains, e.g. Shaqlawa.

Probable foodplant at Shaqlawa, *Fraxinus*; but the moth is fairly polyphagous on trees and bushes. It is univoltine and in Iraq flies in September.

Euro-Siberian. (*A. tragopoginis* L. probably also inhabits the mountains.)

336. *Mormo maura* L.

Inhabits the mountains, especially oases.

Foodplant: *Rubus* and probably other plants and shrubs, at night. Univoltine, flying in autumn, perhaps earlier.

Anatolian-Iranian, with Euroriental range.

337. *Polyphaenis subsericata* H.-S.

Inhabits the woodland zone of the mountains.

Univoltine, flying in September–October.

Anatolian-Iranian.

338. *Apamea monoglypha* Hufn. ssp. *syriaca* Osth.

Inhabits the mountains.

Univoltine, flying in early summer. It feeds on grass-roots.

Euro-Siberian.

339. *Apamea bischoffii* H.-S.

Inhabits the woodland zone of the mountains.

Univoltine, flying in October. It feeds polyphagously on low plants. The early stages were described in Wiltshire (1935).

Anatolian-Iranian.

- 340. *Apamea secalis* L.**
Inhabits Upper Heights of the mountains.
Univoltine, flying in June–July. Feeds internally on grasses.
Euro-Siberian.
- 341. *Procus literosa* Haw. ssp. *subarcta* Stgr.**
The same remarks apply as to the preceding; it seems to be commoner.
- 342. *Luperina dumerilii* Dup. ssp. *aequalis* Schaw.**
Inhabits the woodland zone.
Univoltine, flying in October. Probable foodplant: grass-roots.
Anatolian-Iranian, with Euroriental range.
- 343. *Luperina* (?) *diversa* Stgr.**
This greyer, more clearly marked form has a similar habitat and phenology in Iraq; its genitalia differ slightly.
Anatolian-Iranian.
- 344. *Maraschia grisescens* Osth.**
Inhabits the woodland zone of the mountains.
Univoltine, flying in October.
Anatolian-Iranian.
- 345. *Sidemia ypsilon* Schiff. (= *fissipuncta* Haw.)**
Inhabits the mountains, particularly oases.
It feeds on willow foliage (*Salix*). Univoltine, flying in June–July.
Euro-Siberian.
- 346. *Sidemia apothaina* Brandt 1938.**
Inhabits Middle Heights of the mountains.
Univoltine autumnal, flying in October. The larva hibernates when small and feeds at night on various low plants polyphagously; the early stages were described in Wiltshire (1952).
Anatolian-Iranian.
- 347. *Pseudohadena chenopodiphaga* Ramb.**
Inhabits the deserts and the Middle Heights of the mountains.
Univoltine vernal, flying in March–April.
Anatolian-Iranian, with an Eremic tendency.
- 348. *Ecbolema deceptrix* Stgr.**
This species, according to Boursin i.l., must be removed from its former genus *Catamecia*, but its position under *Ecbolema* is only provisional.
The moth inhabits the Southern plain and is there found in oases.
It feeds in winter and early spring at night on *Lycium* foliage. The moth is univoltine autumnal, flying in November. The early stages were described in Wiltshire (1948, i).
Anatolian-Iranian, Eremic.

348a. *Catamecia minima* Swin.

This Saharan-Sindian little moth occasionally appears in oases and deserts of the South. ? Multivoltine.

349. *Metopoplus boursini* Brandt.

Inhabits Upper Heights and perhaps also lower levels in the mountains.

Univoltine, flying in July–August.

Anatolian-Iranian, its other known locality being in Fars, S.W. Iran.

350. *Dicycla oo* L. (Pl. I, Figs. 25, 26).

The plate shows a normal female and a female ab. *sulphurea* Stgr. devoid of the usual markings. The moth inhabits the woodland zone.

Univoltine, flying in May–June. It feeds on oak foliage (*Quercus*).

Anatolian-Iranian with Euroriental range.

351. *Pseudenargia basilissa* Brandt (= *badiofasciata* Draudt).

Inhabits the mountains.

Univoltine autumnal. The larval is polyphagous on low plants and was described in Wiltshire (1943).

Anatolian-Iranian.

352. *Calamia staudingeri* Warnecke 1941.

Inhabits Upper Heights in the mountains, probably only in moist grassy places.

Univoltine flying in July–August. Probably a grass-root feeder.

Anatolian-Iranian.

353. *Margelana versicolor* Stgr.

Inhabits Upper Heights of the mountains.

Univoltine, flying in September–October.

An Anatolian-Iranian high mountain moth.

354. *Phlogophora meticulosa* L.

Occurs occasionally in the mountains at Middle Heights in autumn.

Probably really bivoltine. The larva attacks various low herbs.

Anatolian-Iranian with Euroriental range.

355. *Actinotia hyperici* Schiff.

Inhabits the mountains and the northern plain, and appears in numbers at Middle Heights.

It feeds on *Hypericum*. In the mountains it flies in May–June and again in July–August. In the plain it appears a few weeks earlier than this. Bivoltine.

Anatolian-Iranian, with Euroriental range.

356. *Stilbina hypaenides* Stgr.

Inhabits Lower Middle Heights of the mountains.

Univoltine, flying in October.

Anatolian-Iranian.

357. *Hypeuthina fulgurita* Led.

Inhabits Lower Middle Heights and desert foot-hills.

Univoltine, flying in October–November.

Anatolian-Iranian.

358. *Rhabinopteryx subtilis* Mab.

Inhabits the Central and Southern plain, especially the desert.

Univoltine vernal, flying in March.

Anatolian-Iranian, Saharan-Sindian.

359. *Hadjina lutosa* Stgr.

Rather scarce, at Middle Heights of the mountains.

Univoltine, flying in April–May.

Anatolian-Iranian.

***360. *Hadjina viscosa* Frr. ssp. *persicola* Strand. (Pl. I, Figs. 27, 28).**

Only in oases of the extreme south; it is quite a common moth in Basra.

Foodplant in Iraq: *Pluchea dioscorides*, planted in Basra as a garden shrub or hedge-plant; it is an oasis plant in the Eremic zone, often growing wild beside canals, and of tropical, Ethiopian origin. The moth is multivoltine and flies almost throughout the year. In the winter large luxuriant purple-brown forms fly (Fig. 28); in the summer, small pale forms (Fig. 27).

Probably of Anatolian-Iranian origin, with an Eremic and Mediterranean range. In the Mediterranean basin it feeds on *Inula viscosa*. Both the foodplants have sticky thick foliage, are strongly aromatic, and have yellow composite flowers in clusters.

361. *Dysmilichia bicyclica* Stgr.

Inhabits desert foot-hills of the Dyala province; probably also the mountains.

Flies in March; whether it is univoltine is uncertain.

Anatolian-Iranian.

362. *Dysmilichia bicolor* Chrét.

One example was recently taken at Abu Ghuraib near Bagdad, in March. Little can be said at present about its biology or status in Iraq.

Anatolian-Iranian, Saharan-Sindian(?).

****363. *Prodenia litura* F. (Pl. IV, Fig. 29).**

THE COTTON WORM.

In Iraq this moth is less of a pest than it is in Egypt, perhaps because of the arid climate and the habit of the caterpillar of feeding exposed on the foliage. In Iraq it is a less serious cotton pest than No. 421 below. This moth is probably migratory and is found throughout the whole plain of Iraq, but has not yet been noted in the mountains. It is sometimes taken in the desert, where perhaps it is only a stray; it breeds particularly in oases, and often defoliates various flowers and vegetables in gardens; being rather polyphagous it probably also feeds on a number of low plants. The larva is most often seen in autumn in gardens. The moth is multivoltine, and on the wing from April to November.

Holo-tropical.

****364. *Spodoptera cilium* Guen. ssp. *latebrosa* Led. (Pl. IV, Figs. 6, 7).**

Inhabits oases of the southern and central plain.

Foodplant: grasses, perhaps also cereals. In S. Africa it has been reported as damaging lawn-grass. In Iraq the adult is common at light, but the larva seldom seen, owing to its aversion to light and nocturnal feeding habit. In early summer the life-cycle from egg-laying to emergence of adult is completed in about 40 days. The moth is multivoltine, flying from April to November.

Palaeo-tropical.

****365. *Laphygma exigua* Hübn. (Pl. IV, Figs. 4, 5).**

Inhabits both the plain and the mountains, and appears in all types of biotope, being migratory. It is also well able to breed temporarily in a variety of habitats and on a variety of foodplants.

Multivoltine, polyphagous. It sometimes defoliates sugar beet, broad beans (*Vicia faba*), cotton (*Gossypium*), Ladies' Fingers or Ochra (Arab. *Bamieh*) (*Hibiscus esculentus*), lucerne, and other crops. It also feeds on many wild herbs. For instance in the southern desert in early spring it feeds on low annual herbs. In the oases in midsummer it has been observed in the river-bed on *Glinus (Mollugo) lotoides* on ground that is covered at high water in spring. It feeds at night and conceals itself in the ground by day. In midsummer it goes down several inches below the surface, thus escaping the intense dry heat. At this season its pupal stage is less than a week in duration. It probably cannot hibernate or aestivate, but its migratory habits save it from extremes of climate. It appears in the very high mountains on the wing in midsummer. In oases of the plain it flies from March to November. In the winter it is on the wing and breeding in the southern deserts, near Kuwait and further south along the shores of the Persian Gulf.

Palaeo-tropical.

366. *Caradrina parvaspersa* Boursin.

Inhabits Upper Heights.

Univoltine, flying in September. The early stages of this and many of the following *Caradrina* species are unknown but it may safely be surmised that they are polyphagous on low plants, and feed at night.

An Anatolian-Iranian mountain moth.

367. *Caradrina surchica* Boursin.

Inhabits the woodland zone of the mountains.

Univoltine, flying in October, rather local.

Anatolian-Iranian.

368. *Caradrina wiltshirei* Boursin.

Inhabits Middle Heights of the mountains.

Univoltine, flying in September–October.

Anatolian-Iranian.

369. *Caradrina ingrata* Stgr.

Inhabits oases of the Southern plain.

Bivoltine, flying in April and October. The foodplant is presumably *Salix* foliage,

since I found the pupae on the Shatt el Arab in a willow-tree fork, and the moth has been taken on the wing near other willow-trees.

Anatolian-Iranian, with an Eremic tendency. (The species which Rothschild recorded from Amarah as *C. pertinax* Stgr. is probably the same species.)

370. *Caradrina zobeidah* Boursin. (Pl. IV, Fig. 8).

Inhabits oases of the plain.

The moth is bivoltine, flying in March–April and October. The larva is polyphagous on low herbs, favouring especially *Sonchus*. The egg hatches after 1 week; it is matt, yellowish-white, with fine sculpture; after a few days a fine brown apical dot and ring appear. The freshly hatched larva is green-grey with blackish-marked head and black setae. In the second instar it is rather transparent and jelly-like, of a yellowish hue and no distinct markings. In the third instar it develops its final appearance, which can best be described as mottled purple-brown, earthy, with confused markings. In the third instar the head is blackish and so are the plated sides of the thoracic and abdominal feet. Later the head is paler with a few black markings; the feet are also paler. In the third instar the setae are still mostly black; later only the lateral setae are conspicuously black. The spiracles remain black. The linear markings are very confused and become almost obsolete in the last instar; in the third instar they consist of an interrupted pale dorsal line and two more widely-interrupted subdorsal pale lines. The sides are sparsely freckled with pale brown in the third instar; in the last instar the freckling has extended so as to obscure the course of the lines. It reaches full-growth after four weeks, i.e. in mid-May. It is averse to light and doubtless, in a wild state, keeps close to the damp soil.

Anatolian-Iranian.

****371. *Caradrina clavipalpis* Scop.**

Inhabits the plains and mountains, appearing in different kinds of biotope. It may well be migratory.

Sometimes destructive in stacks of wheat and other grain. Flies in early summer and autumn; (?) bivoltine.

Euro-Siberian.

372. *Caradrina flava* Ob.

Is known from the desert west of Kerbela.

Bivoltine, flying in March–April and October.

Anatolian-Iranian, Saharan-Sindian.

373. *Caradrina turatii* Boursin.

Was described from two examples, one from Central Asia, the other labelled "Hit. (ex. Hirschke, in coll. Turati)." It has not been retaken in Iraq.

Probably bivoltine, like the preceding.

Anatolian-Iranian, Eremic.

374. *Caradrina salzi* Boursin.

Inhabits the mountains, at Middle Heights.

Probably bivoltine; flies in autumn.

Anatolian-Iranian.

375. *Caradrina zernyi* ssp. *debilis* Boursin.

Inhabits Middle Heights of the mountains.
Probably bivoltine; flies in autumn.
Anatolian-Iranian.

376. *Caradrina belucha* Swinh.

Inhabits the Syrian desert and also the mountains.
Probably bivoltine; flies in autumn.
Anatolian-Iranian.

377. *Caradrina bodenheimeri* Draudt ssp. *chlorotica* Boursin.

Inhabits desert foot-hills, the Northern plain, and Middle Heights of the mountains, perhaps also Upper Heights.

Bivoltine, flying in March–April and September–November. The early stages were described in Wiltshire (1943). The larva is polyphagous.

Anatolian-Iranian.

378. *Stenodrina aeschista* Boursin.

Inhabits lower Middle Heights, favouring oases.
(?) Univoltine, flies in autumn.
Anatolian-Iranian.

379. *Hoplodrina ambigua* Schiff.

Inhabits Middle Heights, favouring oases.

Bivoltine, flying in May–June and September–October. The larva is polyphagous on low plants.

Anatolian-Iranian, with Euroriental range.

380. *Haemassia vassilinini* B.-H.

Inhabits the plain from North to South but is rather scarce. Favours oases.
The phenology is still not known; it has been taken in September.
Anatolian-Iranian.

381. *Arenostola phragmitidis* Hübn. (Pl. II, Fig. 22).

Inhabits swampy ground at Upper Heights. The Plate also shows for comparison the species which replaces it in the South Zagros, *A. delattini* Wilts. (Pl. II, Fig. 21) of which no figure has hitherto been published. The two differ in coloration and genitalia. *A. delattini* was described in Wiltshire (1953).

Univoltine, flying in July–August. Foodplant: reed (*Phragmites*).
Euro-Siberian.

382. *Nonagria typhae* Thunb.

Apparently only inhabits the North of Iraq, and has only been definitely taken in the mountains; it may however occur in marshy spots of the Northern and Central Plain. In the marshes of the southern plain, where its foodplant is plentiful, it is absent. The author has searched its foodplant both on the Hammar Lake and the date-gardens of

Basra in vain for a sign of larval habitation; and the signs of habitation by this species are conspicuous.

The larva feeds internally on bull-rush (*Typha*), and the moth is univoltine, flying in June–July. (It is the largest of the internally-feeding “Wainscot” moths of the *Zenobiinae* sub-family (Nos. 381–386), cf. my remarks under No. 278 above.)

Euro-Siberian.

382a. *Archanara* (?) *insoluta* Warren-Seitz.

In May 1956 Dr. Pringle took at light in the marshes near Amarah, S. Iraq, a male which agrees well with the description (made from the three females from Trans-Caspia) of *insoluta*, except that it is larger than the Seitz, Vol. 3, Pl. 49, figure, the forewing outer margin lacks black spots, there is one, and only one, white spot at the base of the reniform stigma, and the hindwing is more whitish. The genitalia of this male show relationship both to the preceding and the following species.

An Anatolian-Iranian marsh moth.

383. *Archanara geminipuncta* Haw.

Inhabits swampy spots in the mountains, often quite small stream-beds, overgrown with reed and bramble.

Univoltine, flying in June. The larva feeds inside reed stems (*Phragmites*).

Euro-Siberian.

****384. *Sesamia cretica* Led. (Pl. II, Fig. 23).**

Inhabits the plains, perhaps also Middle Heights of the mountains; seems not to be common. In some countries this moth damages cereal crops, especially maize, Indian corn.

Its wild foodplants in Iraq, if any, have not been observed. In the Lebanon it feeds on the wild reed-grass *Saccharum egyptiacum*. In Iraq, Rao has recorded it as attacking maize (*Zea*) (*Ar. Idhrah sufra*) and sugar-cane (*Saccharum*) near Bagdad.

Palaeo-tropical.

***385. *Oria musculosa* Hübn. (Pl. II, Fig. 19).**

Inhabits the plain, perhaps also Middle Heights of the mountains, but is rather scarce. In South Russia it has been reported as damaging cereal crops, biting off the heads of wheat. Whether in Iraq it causes damage worthy of mention seems doubtful.

Probable foodplant: wheat, barley, perhaps grasses. Univoltine, flying in May–June. Anatolian-Iranian, with Euroriental range.

386. *Epipsammia boursini* sp. n. (Pl. II, Fig. 20).

Male antenna, ciliate. Frons, domed, smooth, Eye, smooth. Tongue, very short. Thorax and abdomen, grey-ochreous.

Forewing rosy ochreous with pale nervures heavily grey-edged. The grey edging above and below the median nervure is the most heavy, and contrasts with a long strip of pale ground-colour in the cell, extending above nervure 6 almost to the termen. A similar but less pale and contrasted strip extends between nervures 2 and 3. Costa pale. All dots and fasciae are lacking. Termen, a grey line. Fringes pale basad, grey-tipped. Hindwing dirty white, clouded with grey in the middle; nervures grey suffused. Fringes paler.

Underside forewing, metallic, ochreous, with grey suffusion on radial and median nervures and extending along their branches towards the termen; this suffusion covers over the cell but leaves pale and free the costal area. The space between nervures 6 and 7 is left pale only between the discocellular nervure and the termen. Underside hindwing, dirty ochreous with a metallic glint and some nervures darkened.

Span: 31 mm.

Male genitalia (Text-fig. 5): uncus flattened in the middle, pointed at the tip. Juxta diverging into two rectangular lobes posteriorly, pointed anteriorly. Valve without harpe,

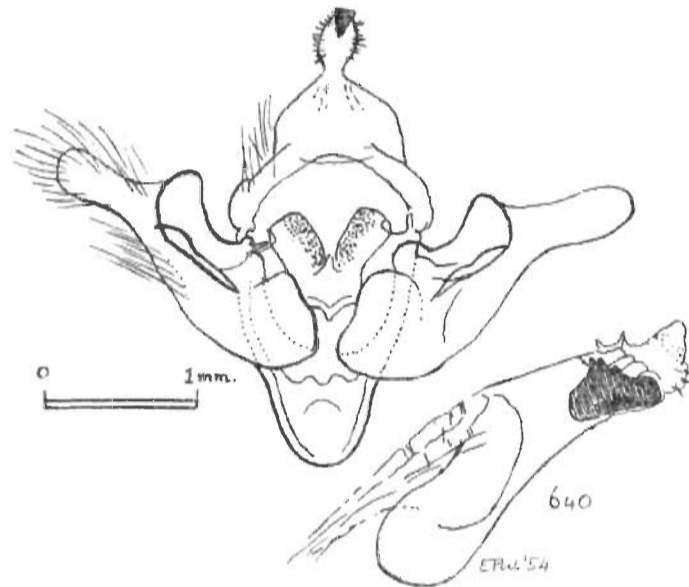


FIG. 5.—Male genitalia, ventral open view, with aedeagus separated, of *Epipsammia boursini* sp. n. (386).

corona or cucullus, the tip being rounded and finger-like and clothed with hairs only; in the congeners there is a corona. Costa of valve thickened and sclerotised in its basal half to form a remarkable saddle-like process; in the congeners the thickening of the costa extends further along the valve. Sacculus heavily sclerotised but short. Saccus oval, well developed. Aedeagus fairly short, thick, cylindrical, slightly curved dorso-ventrally, the vesica being armed with one large plate-like cornutus with three small points projecting at right angles, like a mountain, from the longer side, a number of small single lightly chitinised spines, and a lightly sclerotised blunt cone. Monsieur Charles Boursin has kindly informed me that he has examined the type of *Epipsammia* Stgr. 1879 and is convinced that *Namangana* and *Pseudathetis* are synonyms of it, and that this new species, which I dedicate to him, is an interesting modification of the same type of male genitalia. It should be noted that the new species here described has the Wainscot-aspect of the genotype, *Epipsammia deserticola* Stgr., though larger and robuster than that Central Asian species, while the species of the two genera which Boursin now proposes to sink to the older genus are not marked in the Wainscot manner, i.e. the cross-fasciae of the forewing are developed.

Holotype and paratype: 2 ♂♂, 16 and 17.iv.53, Shaqlawa (in coll. m.)

387. *Megalodes tengistana* Brandt 1938.

Inhabits the mountains.

Univoltine, flying in April, but in June at Upper Heights. Foodplant not yet positively confirmed. It is surmised that a larva feeding inside the flowers and seed-cases of wild hollyhock (*Althaea*) is this species, but the larva has not yet seen successfully bred up.

Anatolian-Iranian. (In the first edition this species was wrongly identified as *Megalodes eximia* Frey. That species is also an Anatolian-Iranian moth but with a more westerly range, occurring in Syria, etc. It differs in aspect and male genitalia slightly.)

388. *Metaegle pallida* Stgr.

Inhabits the Northern plain and the mountains.

Bivoltine, flying in March and May in the Mosul area, in May and July at Middle Heights.

Anatolian-Iranian.

389. *Aegle nubila* Stgr. ssp. *ottoi* Schaw. (nova comb.).

Inhabits the stony deserts of Iraq.

Univoltine, flying in April–May.

Anatolian-Iranian, Eremic. (Schawerda described *ottoi* as a new species but it is a paler desert form of *nubila* from which its genitalia do not differ and the markings of which are similar but heavier. Typical *nubila* forms fly in Syria.)

390. *Aegle rebeli* Schaw.

Inhabits the Northern plain and the mountains.

Univoltine, flying in May–June.

Anatolian-Iranian.

391. *Paraegle ochracea* Ersch. subsp. *subochracea* Stgr.

Inhabits the mountains, from Upper Heights to the Northern desert.

Univoltine, flying in June near Mosul, in July–August at Haj Omran.

Anatolian-Iranian.

392. *Heliothis viriplaca* Hufn. (= *dipsacea* L.)

Inhabits the mountains, both Middle and Upper Heights. Flies by day as well as by night. One may well take this moth flying in the sunlight in wheatfields.

Probably multivoltine, but the records are scanty. It has been taken at Diana (Middle Heights) in May, and at Haj Omran in early August. It may be somewhat migratory. The foodplant in Iraq has not been observed; elsewhere it feeds on *Linaria*, *Silene*, *Melandrium*, *Ononis*, *Crepis*, *Trifolium*, etc.

Euro-Siberian.

****393. *Heliothis peltigera* Schiff.**

This migrant and pest occurs throughout Iraq.

Multivoltine, polyphagous on various flowers and vegetables, such as chick-pea. It is less destructive than the following species.

Anatolian-Iranian, with an Eremic, Mediterranean and rather unusually wide subtropical range.

****394. *Heliothis armigera* Hübn. (= *obsoleta* F.)**

COTTON-BOLL WORM.

In America and S. Africa this moth is destructive. Perhaps the arid climate has prevented

it from being equally so in Iraq. It appears scarcer here than the preceding but its phenology is probably rather similar. In the Middle East the crop it attacks most often is tomato.

A world-wide tropical moth (Holo-tropical).

395. *Heliothis nubigera* H.-S.

This species is also migratory; it is also polyphagous but is more addicted to wild herbs than useful crops and has therefore less often been reported as a pest in other countries. Its foodplant in Iraq has not been noted. The moth has been taken in the plain between June and November, and at Middle Heights in April. It is multivoltine.

Its range is similar to that of No. 393.

396. *Rhodocleptria incarnata* Freyer.

Inhabits desert foot-hills, and the Central Plain.

Univoltine, flying in April.

Anatolian-Iranian, with Euroriental range.

397. *Aedophron phlebophora* Led.

Inhabits the mountains and northern plain, liking rather dry ground.

Univoltine, flying in June-July.

Anatolian-Iranian.

398. *Glaphyra lacernaria* Hufn. ssp. *cretula* Frey.

Known from the Northern plain, where it inhabits steppe-desert; probably also in the mountains.

Elsewhere it is known to feed on *Phlomis*. In N. Iraq it has been taken in June, probably a second generation.

Anatolian-Iranian with Mediterranean range.

399. *Porphyrinia ostrina* Hübn.

Widespread in the mountains, especially in open country. Perhaps also in the plain.

Its foodplant elsewhere is *Helichrysum* and *Carlina*. It is trivoltine, with two flights before summer and a third in autumn. The form *aestivalis* Guen. appears in the second and third.

Anatolian-Iranian with a wide Euroriental range.

400. *Porphyrinia parva* Hübn.

Almost everywhere in the plain, and equally widespread in the mountains. It inhabits desert and oasis biotopes and all kinds of habitat in the mountains.

It feeds on the flowers of *Compositae*. Multivoltine.

Palaeo-tropical.

401. *Porphyrinia albida* Dup.

Inhabits the desert and the mountains. In the former the bleached form *peralba* Schaw. prevails; it was described from near Mosul. In the mountains a more ordinary form is common.

The larva feeds inside thistle stems. The moth is univoltine, flying in May in the plain and a month or two later in the mountains.

Anatolian-Iranian with Pan-Eremic range.

402. *Porphyrinia candidana* F.

Flies at Upper Heights in July, univoltine. Feeds elsewhere on *Helichrysum*.

Anatolian-Iranian with Euroriental range.

403. *Porphyrinia polygramma* Dup.

Inhabits the mountains at 4000 ft. and higher.

Bivoltine, flying in May–June and July–August.

Anatolian-Iranian with Mediterranean range.

404. *Porphyrinia parallela* Freyer.

Inhabits great heights.

Univoltine, flying by day and also coming to light at night, in June–August.

Anatolian-Iranian.

405. *Porphyrinia chlorotica* Led.

Inhabits Middle Heights and probably also Upper Heights in the mountains.

Flies in May–June at Shaqlawa, perhaps later at greater heights.

Anatolian-Iranian.

406. *Porphyrinia suppuncta* Stgr.

Inhabits the mountains.

Flies in May at Middle Heights, in July at Upper Heights. Univoltine.

Anatolian-Iranian.

407. *Porphyrinia straminea* Stgr.

Inhabits Upper Heights in the mountains.

Univoltine, flying in late July.

Anatolian-Iranian.

408. *Chionoxantha staudingeri* Standf.

At Middle and Upper Heights in the mountains.

Univoltine, flying in June–July.

Anatolian-Iranian.

409. *Ozarba moldavicola* H.-S. ssp. *mesopotamica* Schaw.

Inhabits the northern plain, near Mosul. Phenological details are lacking.

Anatolian-Iranian.

410. *Eulocastra schah* B.-Salz & Br.

Described in Salz & Brandt (1937) from Iran. In Iraq it is a mountain moth, fond of rocky places.

Flies from June to September in probably two generations.

Anatolian-Iranian.

411. *Thalerastria diaphora* Stgr.

At Middle and Upper Heights, perhaps also in desert foot-hills.

Bivoltine, but perhaps with only one generation at Upper Heights, where it flies in July.

Anatolian-Iranian with Eastern Eremic range.

412. *Emmelia trabealis* Scop.

Widespread in the plain and mountains. In the plains it appears in oases and desert.

Multivoltine. Feeds on *Convolvulus*.

Euro-Siberian.

413. *Tarache biskrensis* Ob. ssp. *orientalis* Brandt.

Common in the southern deserts, less frequent in oases of the southern and central plain.

Univoltine, flying in April–May.

Saharan-Sindian, of Anatolian-Iranian origin.

414. *Tarache urania* Friv.

Flies at Upper Heights in June. Foodplant: *Althaea*.

Anatolian-Iranian, with Euroriental range.

415. *Tarache lucida* Hufn.

Widespread in the plain and mountains.

Multivoltine, appearing in two generations before and one after midsummer in the plains, and perhaps fewer in the mountains.

Foodplants: *Convolvulus* and *Malva*.

Anatolian-Iranian.

416. *Tarache luctuosa* Schiff.

Inhabits the mountains.

Univoltine, flying in June–July.

Anatolian-Iranian, with Euroriental range.

(Some authors have placed this species in the genus *Acontia* and placed the latter near *Aedia* (No. 464 below); but the genitalia show clearly this moth is conspecific with the preceding two species. Since the name *Acontia* is prior to *Tarache* it would appear that it must replace it ; but I leave this decision for others to confirm first.)

417. *Eutelia adulatrix* Hübn.

Inhabits the woodland zone of the mountains.

Foodplant: *Pistacia* trees. Univoltine, flying in June.

Anatolian-Iranian-Mauretanian.

418. *Eutelia adoratrix* Stgr.

Distribution and foodplant, like the preceding. In Iraq has been taken in mid-July.

Anatolian-Iranian.

***419. *Nycteola asiatica* Krul.**

Inhabits oases in the mountains.

The larva feeds on poplar (*Populus*) foliage. The moth appears to be bivoltine, the first generation flying in midsummer and the second appearing in autumn and hibernating before egg-laying.

(This moth appeared in the first edition under the name *Sarrothripus revayana* Scop. The genitalia however proved to agree with those of *S. hungarica* Kov. (1954) (= *S. populana* Pat. (1953).) which seems to be the same as *S. asiatica* Krulikovsky (1904). According to Obraztsov (1953) *Sarrothripus* Curtis (1824) must sink to *Nycteola* Hübner (1822).)

Anatolian-Iranian, with Euroriental range.

420. *Bryophilopsis roederi* Standf.

Inhabits Middle Heights of the mountains.

Flies in August at Sersang, but this may well be a second brood. Biology, unknown.

Anatolian-Iranian.

****421. *Earias insulana* Boisd. (Pl. I, Figs. 8, 9, 10).**

THE SPINY BOLL-WORM.

Occurs throughout Iraq, except at the great heights, and is a pest in cotton-fields (oases of the plain).

It feeds internally on various members of the cotton family as well as on cultivated cotton (*Gossypium*); namely, dwarf mallow (*Malva parviflora*), hollyhock (*Althaea*), *Lady's Fingers* (Arab. *Bamieh*; *Hibiscus esculentus*), Chinese Hibiscus (*Hibiscus rosa-sinensis* L.), Manchurian Jute (*Abutilon theophrasti*) and Deccan Hemp (*Hibiscus cannahinus*). In the Lebanon it also feeds on Carob (*Ceratonia siliqua*), a tree occasionally seen in Iraqi gardens. The moth is multivoltine and is active all the year round, no true diapause having been noted by the investigators at Abu Ghuraib (Walker and Maimarian, 1954). The eradication of this pest is thus a difficult task owing to the number of wild and cultivated alternative foodplants, some of them exceedingly common, particularly *M. parviflora*, in the first six months of each year.

This variable moth has plain green, green brown-banded and yellowish forms, with intermediates, as shown in the plate; the forms are not strictly seasonal as are those of the following species. Nevertheless the yellowish forms tend to be commoner in the autumn, the green in the spring. The plate also shows some harmless moths with which it might be confused.

Palaeo-tropical.

422. *Earias irakana* Wilts. (Pl. I, Figs. 5, 6, 7).

Inhabits the islands and banks of the Tigris from Mosul to Bagdad and doubtless also the Euphrates. It has not been noted from the Shatt el Arab nor the Karun, nor the upper courses of the tributaries of the Tigris. It tends to spread in oases of the Central plain away from the river wherever its host-tree is planted.

It feeds on Euphrates Poplar (*Populus euphratica*). The moth flies from March to July in two or three generations, the first of which is noticeable for its aberrant colouring which is cryptive, resembling the bud-sheaths of the tree where the moth flies. (Fig. 5) An

intermediate form (Fig. 6) appears rarely in the midsummer generations. These forms were described in Wiltshire (1936, i, and 1944, i).

The moth appears to be an Iraqi endemic.

423. *Earias chlorana* L. (Pl. I, Fig. 12).

Inhabits oases of the mountains.

Flies in two or three generations from mid-April to August. The larva feeds on willow foliage (*Salix*).

Euro-Siberian.

424. *Earias chlorophyllana* Stgr. (Pl. I, Fig. 11).

Inhabits oases of the plain, but is rare. Its biology is unknown.

Anatolian-Iranian.

***425. *Arcyophora dentula* Led.**

Known from oases of the plain of Central and Southern Iraq, but perhaps also an inhabitant of oases of Northern Iraq too, since it is found at Tehran. It appears to be a garden moth, and probably feeds on fruit-tree foliage. The larva was briefly described in Wiltshire (1952).

The moth is multivoltine, and Anatolian-Iranian.

***426. *Xanthodes graellsii* Feisth. (Pl. I, Fig. 4).**

Inhabits oases of the plain.

Feeds on cotton foliage, and is therefore unlikely to do economic damage; it probably also feeds on the other local alternative foodplants of *E. insulana* (No. 421 above).

Palaeo-tropical.

***427. *Syngrapha circumflexa* L.**

Occurs throughout Iraq. Probably migratory. The larva breeds in the desert in the spring, and in oases too. The adult is often very numerous in oases of the plain.

Multivoltine, with at least two generations before its summer disappearance in the plains, and a less numerous autumnal generation. The foodplants include garden flowers and vegetables, and also many kinds of wild low plants.

Anatolian-Iranian.

***428. *Trichoplusia ni* Hübn.**

Occurs throughout Iraq. A migrant. It inhabits deserts and oases in the plain and also flies in the mountains.

Multivoltine, polyphagous on low plants, garden flowers and vegetables. Except for a record from Japan, the range appears Euroriental, of Anatolian-Iranian origin.

429. *Autographa confusa* Steph.

Inhabits the mountains, and is common at Middle Heights, especially in oases.

Multivoltine, flying in four broods between April and October at Middle Heights.

Euro-Siberian.

***430. *Autographa gamma* L.**

Occurs throughout the centre and north of Iraq and probably will also be found in smaller numbers in winter and spring in the south. A migrant.

Multivoltine, polyphagous on low plants, and garden flowers and vegetables. The moth is seen on the wing in deserts in winter and spring; in oases of the plain it is seen in spring in smaller numbers than No. 427. It disappears from the plain in summer.

Euro-Siberian.

***431. *Plusia chalcites* Esp.**

Inhabits the plain and the mountains, with the probable exception of Upper Heights. It has not yet been taken in the Shatt el Arab area but may well be found there one day. It is not a desert moth, and in the plain is confined to oases; the same may be true in the hills.

Bivoltine in Iraq, appearing on the wing in February–March and October. In some climates however it is multivoltine, and in unusual conditions in Iraq it might emerge at other times. It is polyphagous on garden flowers and wild herbs and annual vegetation.

Palaeo-tropical.

431a. *Plusia consona* F. ssp. *taurica* Osth.

Inhabits Upper Heights.

Univoltine, flying in early June.

Anatolian-Iranian, with Euroriental range.

432. *Abrostola clarissa* Stgr.

Inhabits the northern mountains, e.g. Duri near Amadia.

Anatolian-Iranian.

433. *Mormonia mesopotamica* Kusn.

Inhabits the woodland zone of the mountains.

Bivoltine (?), flying in July–August, and October.

Anatolian-Iranian.

434. *Mormonia neonympha* Esp.

Distributed throughout Iraq, commonest in the woodland zone; rather local in the plain, where it has been found in the desert north-west of Mosul and on the Jebel Hamrin.

Univoltine, flying in May in the plain and as late as July–August in the higher mountains. It may be migratory or its wide range in Iraq may be due to its feeding, not on tree foliage as do most of the species of this and the next genus, but on some such shrub as liquorice (*Glycyrrhiza*) or *Prosopis*. Its foodplant is still unknown.

Anatolian-Iranian.

***435. *Catocala elocata* Esp.**

An oasis moth of the mountains and of the plains as far south as Bagdad at least.

Foodplants: *Populus* and *Salix*. Univoltine, appearing in the plain on the wing in June, but in autumn in the hills. Perhaps the imago aestivates; cf. Nos. 143 and 177, which have a similarly obscure phenology.

Anatolian-Iranian. (N.B.—According to Rothschild the Iraqi form is ssp. *locata* Stgr., originally described as a species distinct from *elocata* Esp. The Persian form near Shiraz is probably the same species although Brandt referred to it as *deducta* Ev. The true status of these forms requires elucidation.)

***436. *Catocala puerpera* Giorn.**

The foodplant, habitat and phenology of this moth in Iraq are much the same as those of the preceding.

Anatolian-Iranian with Euroriental range.

***437. *Catocala optima* Stgr.**

It has in Iraq only been taken once, on Karrada island, Bagdad, among poplars; this habitat has since been destroyed. It is presumably widespread but local and not very numerous.

Presumed foodplant: *Populus*. It flies in June, and the same remarks may apply to its phenology as those made for No. 435.

Anatolian-Iranian, the only other known locality being in Central Asia.

***438. *Catocala lesbia* Christ.**

Inhabits oases among desert foot-hills and perhaps up to Middle Heights in Eastern Iraq.

Foodplant: poplar (*Populus*). The moth has been taken at Khaniqin in October but elsewhere it has been observed to be bivoltine. The early stages were described in Wiltshire (1943).

Anatolian-Iranian, ranging from Sinai to South Persia. It appears to be absent from places with a severe winter.

*** 439. *Catocala lupina* H.-S.**

Inhabits the woodland zone of the mountains.

Univoltine flying in August. Foodplant (as reported elsewhere): *Populus* and *Salix*.

Anatolian-Iranian, with Euroriental range.

440. *Catocala abacta* Stgr. ssp. *irana* Brndt.

This form was described in Brandt (1937-8) as representing *abacta* in Fars, and the one example of the moth taken in Iraq so far (at Shaqlawa) seems to come under it. The moth appears to inhabit the woodland zone of the Zagros mountains from north to south. Scarce in Iraq.

Univoltine, flying in June.

Anatolian-Iranian.

441. *Ephesia diversa* Hübn.-G.

Inhabits the woodland zone of the mountains.

It feeds on oak foliage (*Quercus*). Univoltine, flying in June.

Anatolian-Iranian, with Euroriental range. (The species with similar habits and range, *E. nymphagoga* Esp., doubtless also inhabits the Iraqi oak belt but has not yet been proved to occur in Iraq.)

442. *Ephesia nymphaea* Esp.

Inhabits the woodland zone of the mountains.

Foodplant: oak foliage (*Quercus*). Univoltine, flying in June.

Anatolian-Iranian with Euroriental range.

443. *Minucia bimaculata* Ost. (Pl. I, Fig. 22).

The typical form was described by Osthelder (1933) in Pfeiffer (q.v.) and has not yet been illustrated in any publication. The same form inhabits the Kurdish mountains of Iraq and I take this opportunity of publishing a picture of it and of the strikingly different subspecies from the Southern Zagros (Pl. I, Fig. 23) of which I give below a brief description. The moth is an inhabitant of the woodland zone of the Zagros and Taurus mountains at Middle Heights.

Univoltine, flying in April. In Iraq its foodplant has not been observed; in Fars, it is *Pistacia mutica* which is a dominant tree in the scrub woodland there over wide areas, but is rather scarce in Iraq, where *Quercus* dominates. Perhaps the moth feeds on *Quercus* in Iraq and S.E. Turkey. It is Anatolian-Iranian.

Subsp. *pulchrior*, subsp. n. is larger and richer-coloured. The forewing is a lovely lilac-grey, and the hindwings have a more coppery glint. The male genitalia do not differ from those of typical *bimaculata*. The early stages of *pulchrior* were described in Wiltshire (1952). (*N.B.*—The subspecific name there appearing, *nigromaculata*, was a *nomen nudum* and was cancelled in a corrigendum.)

Span: 45–48 mm.

Holotype ♂, and allotype ♀, and three paratypes: hatched from larvae beaten from *Pistacia*, Tang-Ab, nr. Firuzabad, S.W. Iran; emerged: i, ii, 51 (in coll. m.)

*** 444. *Anua tirhaca* Cr. (Pl. I, Fig. 24).**

Inhabits the suburbs of Bagdad, and probably many other parts of Iraq, but not the desert. (It has however been taken in the Syrian desert at Palmyra, presumably because of oasis vegetation. It might feed on *Pistacia* on such desert mountains as Jebel Sinjar, but has not yet been taken so far north in Iraq.)

The foodplant in Bagdad is myrtle (*Myrtus*) which is commonly grown as a hedge in gardens. The moth is never common and will probably never do any harm. It is multi-voltine and liable to appear on the wing in any month of the year, having been noted in January, March, May and November.

A polyphagous Palaeo-tropical species.

*** 445. *Dysgonia algira* L.**

Inhabits Middle Heights and oases of the plain.

Multivoltine. Foodplants: pomegranate (*Punica*), bramble (*Rubus*) and other shrubs and trees. Probably harmless.

Euro-Siberian.

*** 446. *Dysgonia torrida* Guen. (= *albivitta* Guen.)**

Inhabits Middle Heights and oases of the plain.

Foodplants probably the same as the preceding. Multivoltine.

Palaeo-tropical, penetrating Middle East sub-tropics.

447. *Dysgonia orbata* Berio.

Published in Beriot (1955), this species is only known from South-eastern Iraq and from the Sudan. Like the two preceding species, its close relatives, it is, in the plain, an oasis moth. It has not yet been taken in the mountains. Amara is the only known Iraqi locality at present.

Doubtless multivoltine, and with a similar biology to the two preceding.

Perhaps a Palaeo-tropical Eremic specialist. The future, however, may well reveal that this species inhabits many more localities than are known now.

*** 448. *Parallelia geometrica* F.**

Inhabits oases of the plain, e.g. Basra, Bagdad.

Foodplant: *Rubus*, etc. Multivoltine. If it feeds on fruit-trees in Iraq, as it has been reported as doing elsewhere, it is probably harmless, only damaging leaves.

(?) Palaeo-tropical.

449. *Parallelia stolidia* F.

Inhabits Middle Heights of the mountains.

Feeds on oak (*Quercus*) and bramble (*Rubus*), but has not been noted to do so in Iraq yet. Flies in July, but may be bivoltine, or multivoltine.

Anatolian-Iranian.

450. *Parallelia rogenhoferi* Boh.

Inhabits oases of the plain, especially the riverside scrub of the Tigris valley in the Central plain.

Foodplant: tamarisk (*Tamarix*). Multivoltine.

Palaeo-tropical.

451. *Clytie syriaca* Bugn.

Inhabits oases in the plain, and probably also the mountains.

Foodplant: Tamarisk (*Tamarix*). Multivoltine. The early stages were described in Wiltshire (1939, ii).

Anatolian-Iranian. (Rothschild's record of *C. arenosa* from Amarah and Kut is probably an error for this).

452. *Clytie terrulenta* Christ.

Inhabits oases of the plain, and perhaps also the mountains. Neither this nor the preceding species appear to reach the extreme south, where they are replaced by the following species.

Foodplant: Tamarisk (*Tamarix*). Multivoltine. The early stages were described in Wiltshire (1939, ii).

Anatolian-Iranian.

453. *Hypoglaucitis benenotata* Warr.

In the extreme south, inhabits oases of the plain, including dry tamarisk-plantations of the desert, e.g. at Zubair. In the first edition (addendum) this moth was wrongly listed as *Clytie distincta*.

Foodplant: *Tamarix articulata*. This tree does not appear to be planted in the Central Plain. The early stages were described in Wiltshire (1944, iii).

Anatolian-Iranian or Asiatic Tropical, with a Saharan-Sindian range.

454. *Pericyma squalens* Led.

Common from the very south, throughout the plain, into Middle Heights of the mountains, where it is also common. Inhabits both oases and desert and steppe.

Probable foodplant: *Alhagi*, perhaps also *Prosopis*. Multivoltine from about April to October.

Anatolian-Iranian.

(N.B.—The previous record of *albidentaria* proves to be an error for this species; in the slightly-marked forms, it is easily mistaken for *albidentaria* which inhabits Iran, Afghanistan and also Cyprus, and might still be discovered in Iraq.)

455. *Cortyta vetusta* Walker.

Common in the plain and also in the mountains up to Middle Heights. It is associated with the preceding species in Iraq.

Probable foodplant: *Prosopis stephaniana*. Multivoltine.

Its geographical status and range are like those of No. 453. (In the first edition it was referred to as *C. profesta* Chr.)

456. *Syneda flexuosa* Mén.

Widespread in the plain and the mountains, particularly steppe-desert and hilly steppe.

Bivoltine, vernal and autumnal.

Anatolian-Iranian, Pan-Eremitic.

457. *Syneda cailino* Lef.

Common in the mountains.

Bivoltine, flying in June and again in August–September.

Anatolian-Iranian, Euroriental. (Probably *Leucanitis kabylaria* B.-H. and *Cerocala sana* Stgr. inhabit the southern deserts of Iraq, though not yet confirmed thence).

458. *Scoliopteryx libatrix* L. ssp. *pallida* Spul.

Inhabits oases of the Middle Heights and probably also the Upper Heights of the mountains.

Foodplant: willow foliage (*Salix*). Univoltine, flying in August.

(?) Euro-Siberian.

459. *Plecoptera reflexa* Guen. (Pl. IV, Fig. 25.)

Inhabits oases of the Southern and Central plain.

Probably multivoltine.

Tropical Asiatic.

460. *Plecoptera inquinata* Led. (Pl. IV, Fig. 26.)

Inhabits Middle Heights of the mountains.

Probably multivoltine.

Anatolian-Iranian.

461. *Lygephila cracca* Schiff.

Flies at Upper Heights in September, but has only been taken once so far, at Rayat. It appears to like grassy well-watered places.

Foodplant: vetch (*Vicia*). Univoltine.

Euro-Siberian.

462. *Pandesma anysa* Guen.

A migratory species, resident along the rivers, the plain, and intruding into the desert and other biotopes every summer.

Foodplant: *Populus euphratica* and perhaps other trees. The larva eats the foliage but hides under bark, often gregariously, by day. Multivoltine.

Asiatic Tropical with Saharan-Sindian range.

463. *Catephia alchymista* Schiff.

Only one example has been taken, at Mosul. Since its usual foodplant is not found there, this would appear to be a stray, but it has come a long way; the moth is perhaps migratory.

Usual foodplant elsewhere: oak (*Quercus*).

Anatolian-Iranian, with Euroriental range.

464. *Aedia funesta* Esp.

Inhabits Middle Heights of the mountains.

Has been taken in May, a single example.

Anatolian-Iranian, with Euroriental range.

465. *Thermesia arefacta* Swinh.

Inhabits oases in the southern and central plain.

Foodplant: *Prosopis stephaniana*. In captivity the larvae will eat *Acacia farnesiana*, an introduced ornamental garden-tree but it seems likely that this diet is unsuitable, as those so reared failed to produce moths. The moth is multivoltine. The early stages were described in Wiltshire (1944, iii).

This Asiatic Tropical species has an Eastern Eremic range; I recently found it inhabiting the Canal Zone of Egypt, the furthest west it has so far been recorded. In the Jordan valley the two forms *messrae* Stgr. and *elegans* Stgr. occur. In Iraq the race does not differ from the typical race of Pakistan-India.

466. *Acantholipes regularis* Hübn.

Inhabits the mountains and the plains as far south at least as Bagdad.

The foodplant has not been recorded but may well be Liquorice (*Glycyrrhiza*). Probably bivoltine, flying in June, July and August at Middle Heights.

Anatolian-Iranian.

467. *Anumeta sabulosa* Roths.

A single example taken at light in Bagdad on April 22nd, 1955 is the first record of this species in Asia. It is probably a desert moth, and this example a stray from outside the cultivated oasis ground.

Anatolian-Iranian, with a Saharan-Sindian range.

- 468. *Anumeta spilota* Ersch.**
Inhabits the desert west of Kerbela, and is probably more widespread.
Univoltine, flying in April–May.
Anatolian-Iranian, with Pan-Eremic range.
- 469. *Armada panaceorum* Mén.**
Widespread in the plain, especially in stony deserts.
Univoltine, flying in March–May.
Anatolian-Iranian, with Pan-Eremic range.
- 470. *Armada hueberi* Ersch.**
Inhabits the desert foot-hills in East Central Iraq, and may be more widespread in the plain.
Univoltine, flying in March–April.
Anatolian-Iranian, Eremic.
- 471. *Armada turcorum* Zy.**
Inhabits the mountains.
Univoltine, flying in July–August at Upper Heights, probably slightly earlier at Middle Heights.
Anatolian-Iranian.
- 471a. *Armada limata* Christ.**
Flies in February–March in the Central plain; rare. Probably univoltine. Previously known from Transcaspia.
Anatolian-Iranian, probably Eremic.
- 472. *Rivula sericealis* Scop.**
Inhabits the plains as far as the extreme south, close to the rivers. An oasis moth. Probably also inhabits the mountains.
Foodplant: grasses. Univoltine, flying from May to October.
Euro-Siberian.
- 473. *Epizeuxis calvaria* Schiff.**
Inhabits Middle Heights of the mountains, and is there so far only known from oasis ground. Flies in May–June.
Anatolian-Iranian with Euroriental range.
- 474. *Zethes insularis* Ramb.**
Inhabits Middle Heights of the mountains, e.g. Sersang. Flies in August, univoltine.
Anatolian-Iranian, with Mediterranean range.
- 475. *Herminia proxima* Chr.**
Inhabits oases in the mountains. Flies in August–September, perhaps a second brood, since it has been taken in June in Fars, S.W. Iran. The foodplant has not been observed.
Anatolian-Iranian. (This moth was wrongly recorded in the first edition under the name of its close relative *H. crinalis* Tr. which inhabits the Lebanon and further west.)

476. *Rhynchodontodes ravalis* H.-S.

Inhabits the mountains, favouring oases.

Multivoltine, flies through the summer.

Euro-Siberian.

477. *Rhynchodontodes revolutalis* Z. (= *eremialis* Walk., and *syriacalis* Stgr.).

Widespread in the plain from north to south, and also penetrating lower heights in the mountains. In the plain it is found even in the desert but is commoner in oases.

Probable foodplant: *Alhagi*. Multivoltine.

Anatolian-Iranian, with Saharan-Sindian range.

478. *Hypena indicatalis* Walker.

Inhabits oases in the extreme south, e.g. Basra.

Probably multivoltine, the only known Iraqi examples having been taken on 21st May and 1st October, 1943.

Asiatic Tropical.

479. *Hypena obsitalis* Hübn.

Inhabits the mountains, especially cliffs and cave-mouths.

Foodplant: *Parietaria*. Multivoltine.

Anatolian-Iranian, with Euroriental range and also a southward extension across Arabia and across the Tropic to Socotra.

480. *Hypena masuralis* Guen.

No further example has been recently taken, but it doubtless inhabits the southern and central plain, and is perhaps confined to oases.

Asiatic Tropical.

481. *Hypena extensalis* Guen.

This form, perfectly resembling typical specimens from the Ukraine, etc., occurs at Middle Heights in the mountains, e.g. Rowanduz Gorge (Gali Ali Beg).

Univoltine, flying in June. Foodplant: *Parietaria*.

Anatolian-Iranian, with Euroriental range.

482. *Hypena obesalis* Tr.

This darker, more pointed-winged form, with the fringes not chequered on the underside, only seems to be found at Upper Heights.

Univoltine, flying in July–August. Foodplant: nettles (*Urtica*).

Euro-Siberian.

483. *Hypenodes balneorum* Alph.

Inhabits the Central and probably the Southern plain, penetrating the foot-hills and perhaps other parts of the mountains. Has so far only been taken in oases.

Flies in May and November; probably bivoltine.

Anatolian-Iranian.

484. Hypenodes (?) kalchbergi Stgr.

A series taken at Bagdad in the autumn is rather smaller and paler than examples of *kalchbergi* from Amanus (Turkey) in the British Museum. This tiny moth inhabits oases in the Central plain, and may be more widespread.

Apparently univoltine autumnal.
Anatolian-Iranian.

485. Tamsola tarda Wilts.

Described in Wiltshire (1946, j and 1949, i), this rare little moth has not been retaken since the first example at Middle Heights (Rowanduz Gorge) in October 1936.

Apparently endemic.

Super-family: ANTHROCEROIDEA (ZYGAENOIDEA)
Family: ANTHROCERIDAE (ZYGAENIDAE)

486. Procris subsolana Stgr.

The record of *P. pruni* Schiff. (No. 118 in the 1st edition) is to be corrected to read *subsolana* Stgr., a determination reached by genitalia-examination. The actual specimen was very rubbed. This moth flies at Middle Heights, e.g. around Amadia.

Probably univoltine, flying in late May.
Anatolian-Iranian, with Euroriental range.

487. Procris ambigua Stgr.

This moth, whose determination also was confirmed by genitalia-examination, flies at Upper Heights, e.g. at 8000 ft. near Haj Omran.

Univoltine, flying in July. The foodplant is unknown.
Previously only known from Turkestan. Anatolian-Iranian.

488. Procris graeca Jordan ssp. sultana Alb.

This moth, again determined by genitalia examination, inhabits Middle Heights, e.g. at Shaikhan and also near Bakra Jau, South Kurdistan.

Probably univoltine, flying from late April to late May.
Anatolian-Iranian, with Euroriental range.

488a. Anthrocera (Zygaena) cuvieri Boisd.

Flies at Upper Heights in early June. It comes in large numbers to light and is less often seen by day.

Foodplant: *Umbellifera* foliage (see Wiltshire, 1935).
An Anatolian-Iranian peak species.

489. Anthrocera (Zygaena) cambysea Led. ssp. (?) rosacea Rom.

Inhabits Upper Heights, at about 5000–7000 ft. in the various parts of Kurdistan.

Probably univoltine, flying in June.
Anatolian-Iranian.

490. Anthrocera (Zygaena) manlia Led. ssp.

Inhabits Upper Heights in the mountains.

Probably univoltine, flying in June.

Anatolian-Iranian.

491. Anthrocera (Zygaena) (?) tamara Christ. ssp. **placida** B.-H.

Inhabits great heights, e.g. 8000–10,000 ft.

Foodplant: a yellow umbellifer (Kurdish: *Karkul*), probably a *Prangos* sp. The moth is univoltine and flies in early August.

Anatolian-Iranian.

(The identification is perhaps doubtful because the larvae lack the heavy spots shown in *Mitt. Muench. Ent. Ges.* XXVII (1938) as belonging to larvae, from Transcaucasia, of “*Zygaena tamara* ssp. *daemon* Stgr.”). The Iraqi moth answers to the description and figures of *placida* B.-H., described from the Van region of E. Turkey.)

Super-family: GEOMETROIDEA

Family: THYATIRIDAE

492. Palimpsestis ocularis L. ssp. **sareptensis** Spul.

Inhabits oases in Middle Heights of the mountains.

Bivoltine, flying in April to June and again in July. Foodplant: *Salix*.

Euro-Siberian.

493. Polyploca korbi Rebel.

Inhabits oases in Middle Heights of the mountains.

Univoltine flying in April.

Anatolian-Iranian.

493a. Epicimelia theresiae Korb.

This lovely, crimson-tinted moth flies in June at Upper Heights. An Anatolian-Iranian peak species.

Family: DREPANIDAE

494. Drepana binaria Hufn.

Inhabits the woodland zone of the mountains.

Feeds on oak (*Quercus*). Bivoltine, flying in early summer and autumn.

Anatolian-Iranian, with Euroriental range.

Family: GEOMETRIDAE

495. Aplasta ononaria Fuessl. ssp. **faecaturia** Hübn.

Inhabits Middle and Upper Heights in the mountains.

The larva feeds on *Ononis* and the moth flies in grassy pastures where this little thorn grows. Bivoltine, flying in June and August.

The specific identity of this race, with European forms, has been confirmed by the genitalia which also agree with those of the greenish Lebanese form. Some authors have

confused the question by erroneously reversing their preparations; the male tail-parts are asymmetrical. The first brood resembles the European form, the second is smaller and paler.

Anatolian-Iranian, with Euroriental range.

496. *Myinodes interpunctaria* H.-S.

Inhabits Middle Heights in the mountains.

Univoltine, flying in April.

Anatolian-Iranian, with Euroriental range.

497. *Gnophosema palumba* Brandt.

Rather rare and only found at Middle Heights.

The larva feeds on *Amygdalus spartioides* which, though widespread in the scrub zone of the mountains, is less luxuriant in Iraq than in the South Zagros (S. Iran). The moth is bivoltine, and has been taken in Iraq in June and July; both examples are probably the second brood. The larvae were described in Wiltshire (1943).

An Anatolian-Iranian moth, here at its northern and western-most known limit.

498. *Pingasa lahayei* Ob. ssp.: *multispurcata* Prout.

Inhabits oases in the Southern and Central plain.

Foodplant: Nebek or Christ-thorn (*Zizyphus spina-christi*). The moth appears in three generations, spring, early summer, and autumn.

Saharan-Sindian, in range from N. Africa to N.W. India; doubtless of Anatolian-Iranian origin.

499. *Chlorissa pulmentaria* Guen.

Inhabits the mountains and perhaps also the northern plain.

Multivoltine, feeding on *Althaea* and doubtless other herbs.

Anatolian-Iranian, with Euroriental range.

500. *Chlorissa solidaria* Guen.

Was recorded from Fao, in the extreme south. Tropical Asiatic.

501. *Neromia pulvereisparsa* Hamps.

Inhabits the desert foot-hills in Eastern Iraq, and probably also parts of the southern desert.

The foodplant in Iraq has not yet been recorded. Bivoltine, flying in early spring and autumn.

Eastern Eremic, ranging from Egypt to South Persia.

502. *Microloxia polemia* Prout.

Described from Kut-el-Amarah, in the Southern plain. The identity of the Bagdad small emerald moth has not yet been ascertained, but is very likely this same species.

Bivoltine, flying in May and August, or perhaps multivoltine. Endemic, Eremic. Probably an oasis moth.

503. *Microloxia herbaria* Hübn. ssp. *advolata* Ev.

Only known yet from the Southern desert west of Kerbela.

Elsewhere its foodplant is said to be *Teucrium*, and the moth has two or three generations.

African-tropical, with a Euroriental penetration in the Palearctic region.

503a. *Euchloris volgaris* Guen.

Flies at Upper Heights in June. Anatolian-Iranian.

504. *Sterrha rufaria* Hübn.

Inhabits Upper Heights of the mountains.

Univoltine, flying in June–July.

Anatolian-Iranian, with Euroriental range.

505. *Sterrha filicata* Hübn.

Inhabits the mountains, especially at about Upper Middle Heights.

Bivoltine. Flying in May and September–October.

Anatolian-Iranian, with Euroriental range.

505a. *Sterrha allongata* Stgr.

Inhabits desert foot-hills with varied vegetation, e.g. the Upper Dyala basin.

Apparently univoltine, vernal, flying in April.

Anatolian-Iranian.

506. *Sterrha textaria* Led.

Inhabits oases of the mountains and the plain as far south as Bagdad. In the latter it is less common than the following, and confined to rather neglected fruit-gardens. In the mountains, however, it is rather commoner.

Bivoltine, in spring and late summer. Anatolian-Iranian.

507. *Sterrha elongaria* Ramb. ssp. *palaestinensis* Stern.

Inhabits the mountains and the plain as far south as Kut-el-Amarah. In the plain it is probably restricted to oases; it is a common garden insect in Bagdad.

Multivoltine. It is probably, like most of this genus, polyphagous on low plants, whether fresh or withered.

Anatolian-Iranian, with a Euroriental range.

508. *Sterrha obsoletaria* W. subsp. *zeitunensis* Prt.

A single example taken at Middle Heights in the mountains in August seems to show that this species, so numerous in Fars, is rather uncommon in Kurdistan.

Probably multivoltine; doubtless polyphagous on low herbs.

Anatolian-Iranian, with Euroriental range.

509. *Sterrha illustris* Brandt.

Described from the S. Iranian coast in Brandt (1941, ii), this little moth also inhabits the riverside oasis of the Shatt el Arab and perhaps other parts of S. Iraq.

It has been taken in Basra in May and September but may be multivoltine. It is doubtless polyphagous on low herbs.

Anatolian-Iranian, with Eremic range.

510. *Sterrha politata* Hübn. subsp. *abmarginata* Boh.

Inhabits Middle Heights of the mountains.

Univoltine (?), flying in June–July.

Anatolian-Iranian, with Euroriental range.

511. *Sterrha camparia* H.-S.

Inhabits Middle Heights in the Northern mountains, e.g. Sulaf, but appears rather uncommon. Flies in June; probably multivoltine. Foodplant, various low herbs.

Anatolian-Iranian, with Euroriental range.

512. *Sterrha degeneraria* Hübn.

Inhabits the Rowanduz Gorge and doubtless other parts of the woodland zone of the mountains, but appears to be uncommon.

Bivoltine, flying in June and September–October.

Anatolian–Iranian, with Euroriental range.

513. *Scopula ornata* Scop.

Inhabits the mountains, widespread.

Food plant: *Labiatae*. Multivoltine.

Euro-Siberian.

514. *Scopula submutata* Tr. subsp. *taurilibanotica* Wli.

Inhabits the mountains and is widespread. Probably polyphagous, like many others in this genus, on low herbs.

Bivoltine, flying in June–July and again in autumn.

Anatolian-Iranian, with Euroriental range.

515. *Scopula marginepunctata* Goeze.

Inhabits the mountains, and is quite widespread. Polyphagous on low herbs. Multivoltine, with two or three generations, according to conditions.

Anatolian-Iranian, with Euroriental range.

516. *Scopula flaccidaria* Z.

Inhabits swampy or well-watered spots in the mountains.

(?) Bivoltine. Has been taken in July.

Anatolian-Iranian with Euroriental range.

517. *Scopula beckeraria* Led.

Inhabits the mountains, being widespread there; it also occurs in the desert foot-hills and the northern plain.

Multivoltine, flying in spring, midsummer, and autumn, in oases at Middle Heights.

The number of broods seems to be less in some other biotopes. The early stages were described in Wiltshire (1943); the larva is polyphagous on low herbs.

Anatolian-Iranian.

518. *Scopula ochroleucata* H.-S.

Occurs throughout Iraq, except the greatest heights. In the plain, however, it is restricted to oases.

Multivoltine; polyphagous on low herbs.

Anatolian-Iranian with Euroriental range.

519. *Scopula immistaria* H.-S.

Occurs at Upper Heights. Perhaps an oasis moth.

Univoltine, flying in July–August.

Anatolian-Iranian.

520. *Glossotrophia semitata* Prout.

Inhabits the deserts of Northern and perhaps also Southern Iraq; and is common and widespread in the mountains.

Bivoltine, flying vernal and autumnally.

Anatolian-Iranian.

521. *Somatina wiltshirei* Prout.

Inhabits Middle Heights of the mountains, particularly the woodland zone. It is not very common.

It feeds on various shrubs and trees. The early stages were described in Wiltshire (1943). Multivoltine.

Anatolian-Iranian, apparently confined to the Zagros woodland belt, from Iraq to Fars, S.W. Iran.

522. *Rhodostrophia badiaria* Freyer.

At Upper Middle Heights of the mountains.

Univoltine, flying in June.

An Anatolian-Iranian high mountain moth.

523. *Rhodostrophia auctata* Stgr.

Inhabits Upper Heights of the mountains.

Univoltine, flying in July–August.

An Anatolian-Iranian high mountain moth.

524. *Rhodostrophia sieversi* Christ.

Inhabits Upper Middle Heights, also Upper Heights of the mountains.

Univoltine, flying in June.

An Anatolian-Iranian high mountain moth.

525. *Rhodostrophia tabidaria* Z.

Inhabits Middle Heights of the mountains.

Univoltine, flying in May–June.

An Anatolian-Iranian species ranging westwards to the Lebanon and Cyprus; these Eastern forms are distinct in male genitalia from the similarly rosy-coloured more Western Mediterranean species, *calabra*.

526. *Cosymbia ruficiliaria* H.-S.

Inhabits the woodland zone of the mountains, but has so far only been taken at Suwara Tooka.

Foodplant: *Quercus*. Bivoltine; a larva found at Middle Heights in early summer produced a moth in mid-June. This may be the second brood.

Anatolian-Iranian, with Euroriental range.

527. *Rhodometra sacraria* L.

This migrant is widespread throughout Iraq, and especially common in oases. On river islands liable to inundation it has been noted as appearing immediately after the subsidence of May floods which covered, without killing, its foodplant. It inhabits deserts also, but perhaps not all the year round.

Foodplants: *Rumex*, *Polygonum*, *Beta*, etc. Multivoltine.

Palaeo-tropical.

528. *Rhodometra anthophilaria* Hübn.

This species appears to be very similar in habits to the preceding, but scarcer. It is distinguished by the line on the forewing reaching the costa before, not at, the apex, and also in genitalia. The only certain specimen of it which I have seen was taken in Bagdad in October.

Anatolian-Iranian.

529. *Lythria purpuraria* L.

In moist grassy places in the mountains.

Elsewhere it feeds on *Rumex* and *Polygonum* and is bivoltine. In Iraq the foodplant is presumably the same, and it has been taken on the wing in June-July.

Anatolian-Iranian, with Euroriental range.

530. *Lithostege buxtoni* Prout (Pl. IV, Fig. 2).

Inhabits the Northern plain and Middle Heights of the mountains, being associated with stony or hilly steppe.

Univoltine, flying in November-December.

Anatolian-Iranian, from Iraq to Fars, S.W. Iran.

531. *Lithostege dissocyma* Prout (Pl. IV, Fig. 3).

Inhabits desert foot-hills of the Dyala basin, being commoner at about 700 ft. than elsewhere.

Univoltine vernal, flying in March-April. The foodplant is presumed to be *Cruciferae* but efforts to rear the larva from eggs laid by the type female failed.

Apparently endemic; Anatolian-Iranian Eremic.

532. *Lithostege notata* B.-Haas.

Inhabits the Southern deserts and Central plain.

Univoltine, vernal, flying in March.

Anatolian-Iranian, Saharan-Sindian, widespread in deserts from S. Persia to N. Africa.

533. *Lithostege palaestinensis* Ams. ssp. *ali* Wilts.

This race was described in Wiltshire (1941, ii) and is widespread in the plain, both gravel and alluvial. It is a true desert moth, but not infrequently taken in oases.

Univoltine vernal, flying in April–May.

Anatolian-Iranian, Eremic.

534. *Larentia clavaria* Haw. subsp. *pallidata* Stgr.

Inhabits Middle Heights (e.g. at Duri) in the northern mountains.

Foodplant: *Althaea*. Univoltine, flying in October–November. The pupal diapause during the hot dry summer is long; the larva feeds through the winter, if mild enough. The early stages as observed on the Lebanon coast-line were described in Wiltshire (1936, ii).

Anatolian-Iranian, with an Euroriental range. The example from Duri has the forewing postmedial line smoother and the submarginal space less reticulated than in Lebanon examples.

534a. *Ortholitha elbursica* B.-Salz & Brandt.

Flies at Upper Heights in June. An Anatolian-Iranian peak moth.

534b. *Anaitis obsitaria* Led.

Flies at Upper Heights in June. Anatolian-Iranian.

535. *Anaitis plagiata* L.

Inhabits the mountains.

Foodplant: *Hypericum*. Bivoltine, flying in early summer and autumn; at Upper Heights there may be only one brood, as it appears in midsummer.

Anatolian-Iranian with Euroriental range.

536. *Anaitis musculata* Stgr.

Inhabits Middle Heights of the mountains.

Univoltine, flying in April.

Anatolian-Iranian.

537. *Chesias korbi* Boh. subsp. *taurica* Wli. (Pl. IV, Fig. 1).

Flies at Middle Heights, e.g. Duri, in the northern mountains.

Presumably univoltine. Three examples were taken to light in October.

Anatolian-Iranian.

538. *Oulobophora externata* H.-S.

Inhabits the woodland zone of the mountains.

Foodplant: *Pistacia*. The early stages were described in Wiltshire (1935).

It is univoltine, flying in April–May.

Anatolian-Iranian.

539. *Triphosa taochata* Led.

Inhabits the woodland zone, and probably all parts of the mountains where *Rhamnus* grows. Small bushes often survive here and there in badly deforested places, and if so, the moth survives too; the bush also is often found higher than the normal tree-line.

Univoltine, flying in April in Lower Middle Heights, and later higher up. The early stages were described in Wiltshire (1943).

Anatolian-Iranian.

540. *Cidaria obstipata* F.

A Tropical migrant only known yet from the mountains but probably occurring in the plains also.

Multivoltine. Polyphagous on low herbs.

541. *Cidaria fluctuata* L.

Inhabits oases in the mountains, such as Shaqlawa, but is not common.

Multivoltine. Foodplant: *Cruciferae*.

Anatolian-Iranian with Euroriental range.

542. *Cidaria salicata* Hübn.

Inhabits the mountains, especially Middle Height oases and the woodland belt.

Bivoltine, flying in April and October. Foodplant: *Galium*.

Anatolian-Iranian, with Euroriental range.

543. *Cidaria ludificata* (?) Stgr.

Inhabits the woodland zone of the mountains.

Bivoltine, flying in April and October.

Anatolian-Iranian.

544. *Cidaria unicata* Guen.

Inhabits oases at Middle Heights, but seems less common in Kurdistan than in similar situations in Fars, S.W. Iran.

Univoltine vernal, flying in April.

Anatolian-Iranian.

545. *Cidaria bilineata* L.

Inhabits oases, fields and woods in the mountains.

Bivoltine, flying in May and October.

Euro-Siberian.

546. *Cidaria frustata* Tr.

Only known from Upper Heights of the mountains.

Foodplant, like so many of this genus, *Galium*. The moth is bivoltine, flying in June and September.

Anatolian-Iranian with Euroriental range.

547. *Cidaria sandosaria* H.-S. subsp. *mosulensis* Schaw.

No further specimen since the type has been taken. It was taken near Mosul and described in Schawerda as a distinct species from *sandosaria*. The reasons for this view given by the author were not sound. It is probably the same as subsp. *cinneretharia* Ams. which is common in the Jordan valley. The moth appears to be a desert moth.

Anatolian-Iranian, Eremic.

548. *Cidaria polygrammata* Borkh.

Inhabits oases in the mountains and in the plains as far south as Bagdad.

Bivoltine, flying in February–March and October in the Bagdad district, but with a shorter interval at greater heights. Foodplant: *Galium*.

Anatolian-Iranian with Euroriental range.

549. *Eupithecia gratiosata* H.-S.

Has been taken at Shaqlawa and therefore presumably inhabits oases at Middle Heights, or the woodland belt. Flies in May.

Anatolian-Iranian, with Euroriental range.

550. *Eupithecia extremata* F.

This too has been taken at Shaqlawa and is doubtless more widespread in the woodland zone.

Univoltine, flying in April.

Anatolian-Iranian, with Euroriental range.

551. *Eupithecia irritaria* Stgr.

Very common at Upper Heights in the mountains.

Univoltine, flying in July–August.

Anatolian-Iranian.

552. *Eupithecia ultimaria* Boisd.

Inhabits oases of the plain, but has not yet been taken in the extreme south; probably also inhabits river beds in the mountains, up to Middle Heights.

Foodplant: tamarisk (*Tamarix*). Multivoltine.

Anatolian-Iranian, Pan-Eremic.

553. *Eupithecia quercetica* Prout.

Inhabits the woodland zone of the mountains.

Foodplant: oak (*Quercus*) and probably various shrubs. Univoltine, vernal, flying in April. The early stages were described in Wiltshire (1936, ii).

Anatolian-Iranian, ranging in scrub oak-woods westward to the Lebanon and Cyprus.

554. *Eupithecia* sp.

Inhabits Middle Heights of the mountains.

Univoltine, flying in April–May.

555. *Eupithecia* (?) *korvaci* Prt.

Inhabits Middle and Upper Heights of the mountains.

Multivoltine, or at least bivoltine, having been taken in Kurdistan in August and October; in Fars, S.W. Iran, it has also been taken commonly in June.

Anatolian-Iranian.

556. *Eupithecia* *brunneata* Stgr.

Inhabits Middle Heights of the mountains.

Flies in October, probably bivoltine.

Anatolian-Iranian.

557. *Gymnoscelis* *pumilata* Hübn.

Inhabits Middle Heights of the mountains and probably the Northern plains to a lesser extent. It has not been noticed in the centre and south, which is surprising.

Polyphagous on herbs, flowers and blossoms of trees and shrubs. Multivoltine.

Anatolian-Iranian with Euroriental range.

558. *Bapta* *mimetes* Wli.

Inhabits Middle Heights of the mountains.

Univoltine, flying in April. Probably it feeds on *Prunus*, *Amygdalus* and *Crataegus*.

Anatolian-Iranian, only known from the woodland zone of S.E. Turkey and Iraq. These examples were determined by male genitalia. (The somewhat similar *B. distinctata* subsp. *orientalis* Stgr. occurs from the Balkans to the Lebanon but apparently does not reach Iraq.)

559. *Epitherina* *bahmana* Wilts.

Inhabits Middle Heights in the mountains.

It feeds on *Prunus* and *Amygdalus* bushes. It is univoltine, flying in April. The early stages were described in Wiltshire (1952).

Anatolian-Iranian, only known from the woodland belt of S.W. Iran and Iraq. These examples were determined by male genitalia and frontal armature. (The very similar *E. rhodopoleos* Wli. occurs with it in Fars but apparently does not reach Iraq.)

560. *Epitherina* *ghirshmani* Wilts.

Common at Middle Heights in the mountains in the woodland zone.

It feeds on *Prunus* and *Amygdalus* bushes. It is univoltine, flying in April. The early stages were described in Wiltshire (1952).

Anatolian-Iranian, known only from the woodland belt of S.W. Iran and Iraq. The Kurdish and Fars races are not distinguishable. The moth seems somewhat commoner in Iraq than in Persia.

561. *Ennomos* *olivaria* Brandt.

Described in Brandt (1938), this moth inhabits the woodland zone of the mountains, but seems rather uncommon.

Presumed foodplant: oak (*Quercus*). A single example was taken in June, and it is unknown whether the moth is univoltine or bivoltine.

Anatolian-Iranian, known only from the woodland belt of S.W. Iran and Iraq.

562. *Ennomos fraxineti* Wilts.

This interesting moth in the *E. fuscantaria* group, inhabits oases at Middle Heights of the mountains; it was described in Wiltshire (1947).

Univoltine, flying in July–August. Presumed foodplant (by analogy of relatives and available foodplants in all known habitats): ash foliage (*Fraxinus*).

Anatolian-Iranian, somewhat more sidespread than the preceding, reaching also Turkey and Iran.

563. *Eumera hoferi* Wli.

Inhabits the woodland zone and also oases at Upper heights. Univoltine autumnal. Anatolian-Iranian.

564. *Dasycorsa modesta* Stgr.

Inhabits Middle Heights of the mountains.

Foodplant: *Papilionaceae*. The early stages were described in Wiltshire (1935). Univoltine, flying in April.

Anatolian-Iranian, ranging from the Central Zagros (Luristan) to the mountains of the E. Mediterranean basin.

565. *Eilicrinia cordiaria* Hübn.

Very common in oases in the mountains.

Foodplant: willows (*Salix*). Bivoltine, flying in May and July–August.

Anatolian-Iranian, with Euroriental range.

566. *Semiothisa aestimaria* Hübn.

Widespread in Central and Northern Iraq, but restricted to oases.

Foodplant: tamarisk (*Tamarix*). Multivoltine, flying from February to November, with a summer pause, in the plain. Its absence from the Shatt el Arab is probably simply due to the scarcity there of its preferred species of tamarisk.

Anatolian-Iranian, Pan-Eremic.

567. *Semiothisa syriacaria* Stgr.

Widespread in the plain and also inhabiting up to Middle Heights of the mountains.

Foodplant: *Prosopis stephaniana*, and probably also liquorice (*Glycyrrhiza*) and other *Papilionaceae*.

Anatolian-Iranian.

568. *Gnopharmia objectaria* Stgr.

Inhabits Middle Heights of the mountains. Apparently univoltine, flying in April.

Anatolian-Iranian.

569. *Gnopharmia erema* Wli.

Inhabits deserts, particularly those of the south-east. Apparently univoltine, flying in April–May.

Anatolian-Iranian, Eremic.

570. *Gnopharmia colchidaria* subsp. *melanotaenia* Wli.

Inhabits the mountains. Apparently univoltine, flying at Middle Heights in May–June, and at Upper Heights in July–August.

Anatolian-Iranian.

571. *Gnopharmia irakensis* Wli.

Inhabits the mountains. Apparently univoltine, flying in July–August.

Anatolian-Iranian.

572. *Neognopharmia stevenaria* Boisd.

Inhabits oases and woodlands in the mountains.

Probably polyphagous on trees and shrubs, perhaps also fruit-trees. Bivoltine, flying in early summer and autumn.

Anatolian-Iranian.

573. *Apocheima suleimania* Wli.

Inhabits the Middle Heights of the mountains, the type having been taken at Bakra Jo; probably, in view of the capture, in the Syrian steppe, of a second example, widespread in the northern plain.

Univoltine vernal, flying in late March. The foodplant is probably various low herbs.

Anatolian-Iranian. (The Syrian example, for which I am indebted to Abdul Mun'im S. Talhouk, is rosier than the Iraqi, but without more material from both habitats it should not be named.)

574. *Zamacra flabellaria* Heeg.

Inhabits the Central plain, and probably other parts of Iraq.

Univoltine, flying in December–February. The larva is polyphagous.

Anatolian-Iranian.

*** 575. *Nychiodes variabilis* Brandt.**

Widespread in the woodland zone of the mountains and also resident in apricot orchards in the plain.

Foodplant: *Prunus* and *Amygdalus* trees and shrubs. In Bagdad it feeds on the cultivated apricot (Arab: *mish-mish*) but probably it is harmless. The larva feeds at night. In the mountains there are three generations, flying in (i) May, (ii) June–July, and (iii) September–October. In the plain the first brood flies in March and the life-cycle is less known. The early stages were more fully described in Wiltshire (1943).

Anatolian-Iranian, characteristic of the Zagros range scrub woods, and ranging from East Turkey to South Persia.

576. *Nychiodes rayatica* sp. n. (Pl. III, Fig. 10).

It inhabits Upper Middle Heights and is probably also an inhabitant of neighbouring mountains in N.W. Iran and E. Turkey.

Univoltine. Foodplant: Wild *Amygdalus*.

This new species is of middle size, and superficially resembles *N. subfusca* Brandt and certain forms of *N. divergaria* Stgr. Its genitalia clearly distinguish it from both, and the concave forewing costal form and rather narrow wing shape seem also to characterise it.

Male antenna strongly bipectinate, with dark pectinations and paler shaft, whitish grey irregularly banded with fuscous. Head with a pale tuft of scales behind the antennae between the eyes. Thorax and abdomen brown, darkened heavily with grey.

Both wings are indistinctly marked. Forewing with first half of costa concave, second half convex; sometimes the forewing is suffused with slate-grey from base to post-medial line. The ground-colour is sometimes left clear in two patches in the apical half of the costa, the first of which is in the centre of the medial band. The ante-medial and post-medial fasciae are vaguely indicated with a few blackish scales, and the cell-spot is an obscure small grey oval. The medial area is as in *subfusca*, but very vaguely defined. Terminal crescents fuscous, forming a wavy dark marginal line, pale edged outwardly. Fringes pale, with a grey band, chequered grey at the nervures.

Hindwing generally similar to forewing.

Underside: whitish buff, marked with fuscous on the costa. The markings are obsolete, except that the fringes appear grey-chequered.

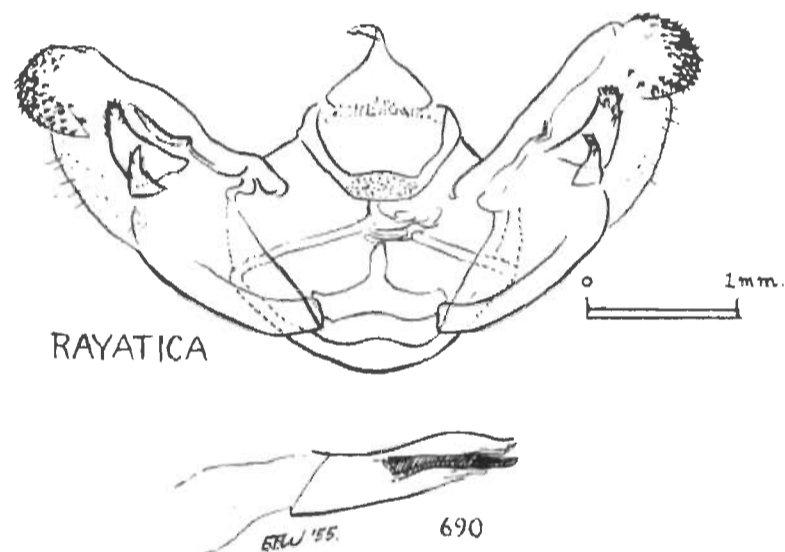


FIG. 6.—Male genitalia, ventral open view, with aedeagus separated, of *Nychiodes rayatica* sp. n. (576).

The male genitalia are shown in Text-fig. 6. They show that the species comes next to *divergaria* Stgr., but is quite distinct. The uncus is tapering, the gnathus, band-like; the valve, with widely sclerotised costa terminating in a large pin-cushion-like, densely setose, rounded, slightly ventrally-directed buffer; the sacculus only extends half the valve-length and curves up to the harpe which is situated normally and centrally in the valvula and accompanied by a smaller pseudo-harpe below it and overlapping it; the harpe is sub-conical, blunt-tipped, strongly setose or scobinate and slightly curved, pointing towards the end of the costa; the pseudo-harpe is also scobinate but more thorn-like and points towards the middle of the costa. The aedeagus contains one finger-like cornutus, which has a distinctly narrowed waist not far from its base.

Span: 38–40 mm.

Holotype and paratypes: three males Prep. 2558 BM, taken by me on 27.vii.35, Haj Omran (6000 ft.), and Prep. E.P.W. 690, 24.vi.35, at Rayat at about 5000 ft. and ex-larva *Amygdalus*, Haj Omran, c. 6000 ft., hatched 1.vii.56 (in coll. m.).

577. *Hemerophila engys* Wli.

Inhabits Middle Heights of the mountains, but only one example has been taken, at Berserini.

Univoltine autumnal, flying in October.

Apparently endemic.

578. *Boarmia rhomboidaria* Schiff. subsp. *syritaurica* Wli.

Inhabits oases and the woodland of the mountains.

Bivoltine, flying in early summer and autumn. The larva is fairly polyphagous but prefers trees, shrubs and creepers to low herbs.

Anatolian-Iranian, with Euroriental range.

579. *Boarmia umbraria* Hübn.

Inhabits the woodland zone of the mountains.

Bivoltine, flying in June and September–October. It is fairly polyphagous on trees and shrubs, including *Acer*.

Anatolian-Iranian with Mediterranean range.

580. *Jordanisca tenuisaria* Stgr.

Inhabits oases of the extreme south, and has only been noted yet at Basra.

Univoltine, flying in November. The larva feeds up by April on *Lycium barbarum*. In phenology, foodplant, and range it thus closely resembles No. 348 above. The early stages were described in Wiltshire (1944, iii).

Anatolian-Iranian, Eastern Eremic, ranging from S. Iraq to Arabia, and the Jordan valley.

581. *Gnophos stachypora* subsp. *hamadana* Wli.

Inhabits the mountains.

Probably bivoltine, flying at Upper Heights in July–August, and at Middle Heights in July and October.

An Anatolian-Iranian mountain moth.

582. *Gnophos snelleni* Christ.

One female came to light at 11,000 ft., Algod; the moth is doubtless common at great heights in the mountains.

Probably univoltine, flying in early August and probably late July.

An Anatolian-Iranian high mountain moth. (The Iraqi example agrees in all particulars with the details in Seitz, Vol. IV, Suppt., except that the hindwing underside postmedial fascia is absent.)

583. *Gnophos wiltshirei* Wli.

Inhabits Middle Heights of the mountains. Flies in midsummer, presumably univoltine. Apparently endemic.

584. *Gnophos wanensis* Wli.

Inhabits Middle and Upper Heights of the mountains. Flies from August to October, presumably univoltine.

An Anatolian-Iranian mountain moth.

585. *Gnophos chorista* Wli.

Inhabits the mountains. A single example taken in Rowanduz Gorge on October 1st, 1936 is the only Iraqi specimen; but the species has been retaken at greater heights in Central Iran.

An Anatolian-Iranian mountain moth.

586. *Gnophos onustarius* H.-S.

Inhabits the mountains.

In Europe said to be bivoltine, in the Taurus mountains, trivoltine. Polyphagous on low plants.

Anatolian-Iranian, with Euroriental range.

587. *Gnophos variegatus* Dup.

Inhabits the mountains.

Probably bivoltine, though in Iraq only noted in June and July.

Anatolian-Iranian with Euroriental range.

588. *Gnophos pollinarius* Christ.

Inhabits Upper Heights of the mountains. Flies in June–July, presumably univoltine.

An Anatolian-Iranian high mountain moth.

589. *Tephрина disputaria* Guen.

Has been reported from Amarah.

Foodplant: *Acacia*. Multivoltine. This interesting record seems to indicate that at Amarah there exists the northernmost stand of *Acacia* in the Persian Gulf area. In general it can be said that the absence of an indigenous *Acacietum* in Iraq impoverishes the country's insect fauna by making it impossible for the *Acacia* fauna to inhabit the country, but this record makes it necessary to qualify that conclusion with some reserves.

Palaeo-tropical penetrating the Saharan-Sindian deserts.

590. *Tephрина perviaria* Led.

Inhabits the Central and Southern plain, in oases.

Multivoltine.

Asiatic-tropical.

591. *Dyscia osmanica* Wagn.

Inhabits Middle Heights of the mountains.

Bivoltine, flying in April–May and the autumn.

Anatolian-Iranian.

592. *Dyscia plebejaria* Ob.

Inhabits the deserts from North to South.

Bivoltine, flying in March–April and October.

Anatolian-Iranian, Eremic, Saharan.

593. *Aspilates ochrearia* Rossi.

Inhabits Middle Heights of the mountains.

Bivoltine, flying in April–May and autumn. Polyphagous on low plants.

Anatolian-Iranian, with Euroriental range.

Super-family: PYRALOIDEA

Family: PYRALIDAE

Though following Marion (1954) in the order of the groups, I do not follow him in elevating them from sub-family to family rank, since confusion will result from restricting the application of the above family name to one, and that almost the smallest, of the six main groups.

**** 594. *Ephestia cautella* Walk.**

THE FIG MOTH.

Inhabits date-gardens of the southern and central plain, and is probably much more widespread in shops, houses, warehouses, etc.

Attacks fallen dates in date-gardens but has never been noted feeding on growing dates. Outside Iraq it is well-known as a stored-product pest. Multivoltine. Infestation of stored dates can probably be avoided if, when cut, they are kept under a screen and not mixed with windfalls or other infected products.

***595. *Ephestia dowsoniella* Rich. & Th.**

Described in *Trans. R. ent. Soc. London*, **80**, Part II, p. 182 (1932).

In this description the type is said to have been a female taken at light on Oct. 15th at Basra. However, Major Dowson has informed me that the type was a female bred from windfall dates. Presumably the authors misunderstood the captor's label.

No further records exist of this moth which is presumed to resemble the preceding in most respects but to be less of a pest and less widespread.

(*N.B.*—The probable occurrence of *Plodia interpunctella* Hübn. in Iraq still awaits confirmation.)

****596. *Ephestia elutella* Hübn.**

Recorded by Rothschild from Amarah.

Attacks stored products of many kinds and inhabits warehouses, shops, etc., widely almost throughout the world. Multivoltine. Tolerates cold better than *cautella* Walk.

**** 597. *Ephestia calidella* Gn.**

Recorded by Rothschild from Bagdad and Amarah.

Attacks stored products especially dried fruit. Multivoltine, having been taken between June and September.

*** 598. *Spermatophora hornigii* Led.**

Recorded by Rothschild from Basra, Amarah, and Bagdad, as having been bred from larvae found feeding on windfall dates, the moth being obtained in September.

599. *Homoeosoma costalbella* Ams.

Described in Amsel, 1953.

Inhabits the date gardens of the Shatt el Arab and flies in November.

600. *Macalla lophotalis* Hamps.

Inhabits Middle Heights of the mountains, flying in July.

601. *Ancylodes kerbelella* Ams. (Pl. VII, Fig. 10, gen.).

Described in Amsel (1949, i), this moth inhabits the desert west of Kerbela, flying in March to May.

602. *Saluria maculivitella* Rag.

Widespread in the central and southern plain, inhabiting both oases and desert. Apparently bivoltine, flying in April–June and again in September–October.

603. *Saluria pulverosa* Hamps.

Recorded by Rothschild as having been taken at Bagdad and Amarah in October.

604. *Ancylosis albicostella* Ams.

Described in Amsel, 1950, ii, from Fars, S.W. Iran, this species has recently been recaptured at Shaqlawa. It seems to be a vernal univoltine species, flying in Iraq in May but further south earlier in the year. It inhabits Middle Heights and perhaps desert foothills of the Zagros range.

605. *Cornigerula eremicola* Ams. (Pl. VII, Figs. 11, 12).

Described in Amsel, 1935, ii, from near the Dead Sea, Jordan, this species has been recaptured near the Bahr Nejf and is doubtless widespread in the deserts of south-west Iraq. It flies in March.

606. *Heterographis rhodochrella* H.-S.

Inhabits Middle Heights of the mountains and oases of the plain but is scarce.

607. *Heterographis hellenica* Stgr.

Inhabits oases of the plain. Multivoltine.

608. *Heterographis concavella* Ams. (Pl. VII, Fig. 7 and Pl. XVII, Fig. 84).

Described in Amsel (1949, i) this species is widespread in the plain, inhabiting both desert and oases. It seems to be bivoltine, flying in April–May and October.

609. *Heterographis convexella* Led.

Inhabits Middle Heights of the mountains and is widespread and common in the plain, inhabiting both desert and oases. Apparently bivoltine.

610. *Heterographis harmoniella* Rag.

Inhabits the desert west of Kerbela, flying there in March.

611. *Heterographis subcandidatella* Rag.

Common in the Central and Southern plain, both in oases and the desert. Multivoltine, flying in March, May, July–August, and September–October.

612. *Heterographis candidatella* Led.

Common in the Central and Southern plain, both in oases and the desert. Bivoltine, appearing in April–May and October.

613. *Heterographis fulvobasella* Rag.

Recorded by Rothschild from Amarah in June.

614. *Heterographis monostictella* Hamps.

Recorded by Rothschild as flying in Amarah in September.

(*N.B.*—*Heterographis buxtoni* Roths. will be found as a synonym in *Anerastia*, having been wrongly diagnosed by Rothschild.)

615. *Trissonca muliebris* Meyr.

This species was described from Mosul in Meyrick (1936) and illustrated in Amsel (1953). It has been taken in Iran and Kuwait and is probably more widespread in Iraq than its capture in Mosul would indicate. It inhabits dry steppes and deserts.

616. *Trissonca oblitella* Z. (= *ischnopis* Meyr.).

Inhabits Middle Heights of the mountains and also the Northern and Central plain, flying in June.

617. *Trissonca aegyptiacella* Rag.

One doubtful record from Bagdad in March.

618. *Trissonca crocotoxa* Meyr.

Described in Meyrick 1936 from Ser Amadia in the Northern mountains. Amsel proposed to cancel the name owing to the bad state of the surviving type and unless Meyrick's collection, now in the British Museum, also contains a type, I would agree.

619. *Trissonca polycapna* Meyr.

Described in Meyrick (1936) from a specimen taken, like the preceding, in August near Amadia.

620. gen. (?) sp. (?)

This plain straw-coloured Phycitine moth (Preparation No. 773) flies in late July at Upper Heights and cannot be named yet. The male genitalia suggest a relationship with *Eurhodope* and *Myelois* (Nos. 667–679 below).

621. *Laodamia postalbidior* Roths.

Rothschild's type was taken in April 1918 in Amarah and is in the British Museum. It seems to be a sp. b., distinct from *fusca*, as a form of which it was described.

622. *Anoristia gilvella* Rag.

Inhabits the southern desert of Iraq and is probably multivoltine, appearing in March, May and October.

623. *Auxacia bilineella* Rag.

Widespread in the plain, inhabiting deserts from north to south and flying in several generations from March to October.

624. *Ahwazia albocostalis* Ams. (Pl. VIII, Fig. 17 (gen.)).

Described in Amsel (1949) from specimens taken at Ahwaz in Iran and Qaraghan (now Jalula) in the Dyala province of Iraq, this little species appears to inhabit desert foothills and to be at least bivoltine, flying in March and October.

625. *Staudingeria adustella* Rag.

Inhabits the deserts of Central and Southern Iraq and also is found in oases, such as the cultivation near Bagdad. Flies in March, May and October, and so is at least trivoltine.

626. *Pristocera solskyi* Chr.

Inhabits Upper Heights of the mountains, flying in one generation in July-August.

627. *Pristophora nigrigranella* Rag.

Has been taken in April in the desert west of Kerbela, and may well occur in steppe desert elsewhere being also known from near Shiraz, Iran.

628. *Pristophora alphetopis* Meyr. (Pl. VIII, Fig. 18, gen.).

Inhabits Upper Heights, flying in late July. It was described in Meyrick (1936).

629. *Taftania oxycyma* Meyr.

Described in Meyrick (1936) in the preceding genus, this species was illustrated and given a new genus in Amsel (1951, ii and 1953). The original type was taken in the Rowanduz Gorge in June 1935, that is at Middle Heights in Iraq. It has since been discovered to fly in the South Iranian mountains in May and June.

630. *Psorosa nucleolella* Möschl.

Inhabits the Central and Southern plain, being known from oases such as Bagdad and Amarah. It flies between May and October and may be multivoltine.

631. *Psorosa dahliella* Tr.

Inhabits Middle and Upper Heights around Sersang and Amadia, in the Northern mountains. Univoltine, flying in July-August.

632. *Lasiosticha hieroglyphella* Rag.**633. *Aphyteles ochreella* Rag.**

634. *Melanastia serraticornella* Z.

These three species were recorded by Rothschild from Amarah. In such cases, where the identification of the specimens taken by Buxton in 1918–9 has not been confirmed by a specialist in the family and the species has not been recaptured in Iraq, one must treat Rothschild's records with some reserve.

635. *Candiope uberalis* Swin. (= *discomaculella* Rag.).

Inhabits the northern and southern deserts, and is at least bivoltine, flying in April–May and October.

636. *Candiope pseudodiscomaculella* Ams.

Known from Mosul but probably similar in range and phenology to the preceding. Described in Amsel (1935, i).

637. *Hyphantidium albicostale* Walk. (det. Meyrick).

Inhabits Middle Heights of the mountains, flying in April–May.

638. *Epilydia liturosella* Ersch.

Inhabits Middle Heights of the mountains. Bivoltine, flying in May–June, and October.

639. *Euzophera formosella* Reb.

Inhabits the desert west of Kerbela, flying in May.

640. *Euzophera pulchella* Rag.

Inhabits Middle and Upper Heights of the mountains; bivoltine, flying in June–July and September.

641. *Euzophera subcribrella* Rag. (= *P. mercatrix* Meyr.).

Inhabits the Central Plain, occurring in oases and appearing in larger numbers in the desert west of Kerbela. It flies in March.

642. *Euzophera lactiflora* Meyr.

Described in Meyrick 1936, this species is known from Mosul, where the type was taken in August.

643. *Phycita diaphana* Stgr.

Inhabits the Central Plain, both in oases and deserts. Multivoltine (?). The larva is fairly polyphagous having been observed on *Ricinus*, *Populus euphratica*, and *Chrozophora verbascifolia*.

644. *Phycita eremica* Ams. (= *S. aciculata* Meyr.).

Described in Amsel (1935, i) from the Jordan valley where it is clearly multivoltine. It has been taken in Bagdad in October and December.

645. *Ptyonocera proteroleuca* Meyr. (Pl. X, Fig. 32; Pl. XVII, Fig. 89).

Described in Meyrick (1936). Flies at Upper Middle Heights in September.

646. *Ichorarchis iozona* Meyr. (Pl. X, Fig. 31, Pl. XVII, Fig. 85).

Described in Meyrick (1936), this moth inhabits Middle Heights of the mountains, flying in June.

647. *Arimania komaroffi* Rag. (= *diplocapna* Meyr.).

Inhabits Middle Heights of the mountains, flying in July–September.

648. *Nephopteryx macrocirtensis* Ams.

Described from Shiraz in Amsel (1953), this species also inhabits Middle Heights of the Iraqi Kurdish mountains, where it flies in July.

649. *Nephopteryx divisella* Dup.

Inhabits Middle Heights of the mountains, flying in October.

650. *Nephopteryx rhenella* subsp. *laetifica* Rag.

Inhabits Middle Heights of the mountains. Flies in July.

651. *Nephopteryx eustatica* Meyr. (Pl. X, Fig. 29; Pl. XVII, Fig. 88).

Described in Meyrick (1936), this species occurs at Upper Middle Heights of the mountains.

652. *Anephopteryx designella* Ams.

Described in Amsel (1955) this moth inhabits the southern desert of Iraq where it flies in May.

653. *Tephris stenopterella* Ams.

Described in Amsel (1949, i), this moth inhabits oases of the Central plain of Iraq, also the Jordan valley. The larva feeds on tamarisk (*Tamarix*) and was described in the original description.

654. *Praesalebria argyrophanes* Meyr.

Described in Meyrick (1936) this little moth inhabits the woodland zone of the mountains and flies in June–July.

655. *Oligochroa sordida* Stgr.

Widespread in the plains, inhabiting the desert and sometimes oases too. Multivoltine.

656. *Oligochroa dionysia* Z. (= *isoxyla* Meyr.).

Inhabits oases of the plains. Multivoltine.

657. *Salebria gracilis* Roths.

This species was in Amsel (1949, i) referred to under the name of *metamelana* Hamps., but that author now regards *gracilis* as a good distinct species and the Iraqi forms as belonging to it. The species inhabits Middle Heights of the mountains and also the plains; it is univoltine, autumnal. Illustrated in Amsel (1955).

658. Salebria coremetella Ams. (Pl. IX, Fig. 27, 28, gen.).

Described in Amsel (1949, i), this moth inhabits the middle heights of the mountains and the desert west of Kerbela and also North Africa. It flies in April–May.

659. Salebria lepidella Rag.

Inhabits the Kurdish mountains and probably also the desert foot-hills, flying in April–May.

660. Salebria acervella Ersch.

Recorded by Rothschild from Bagdad in September.

661. Salebria semirubella Sc.

Flies at oases at Middle Heights and the plain. Elsewhere the larva has been observed to feed on trefoils from August to June. Univoltine.

662. Salebria romanoffella Rag.

Inhabits Middle Heights of the mountains, flying in June.

663. Salebria palumbella F.

Inhabits the woodland zone of the mountains, flying in June.

664. Myrllaea albistrigata Stgr.

Inhabits Middle and Upper Heights, flying in June–July.

665. Irakia simplicialis Roths. (= *pallens* Ams.) (syn. nov.).

A specimen taken in Amarah in June was described in Roths. (1921) as *Dattinia simplicialis*. Why he placed an obvious Phycitine in that genus is inexplicable. Later, examples taken at Quraitiya, west of Basra in June, were described by Amsel (1955) as *Irakia* (gen. n.) *pallens*. Mr. E. L. Martin has examined Rothschild's type and pronounced the two identical. The species resembles *Myelois margaritella* Tur. (No. 679), and Rothschild's remarks about a further example from Algeria may well refer to that species.

666. Aproceratia rhexogramma Meyr.

This species was described in Meyrick (1936); it was illustrated in Amsel (1950, i). It inhabits Upper Heights and flies in July–August.

667. Eurhodope monogrammos Z.

Inhabits the mountains and desert foot-hills, flying in May–June. (N.B.—*Eurhodope buxtoni* Roths. is a synonym of *Myelois cinerea* Stgr. No. 678 below).

668. Acrobasis atrisquamella Rag.

This is probably the right name for a rubbed specimen of a moth flying in August at Sersang, Middle Heights.

669. Rhodophaea dulcella Z.

Inhabits Middle Heights, flying in June.

670. *Epiepischnia pseudolydella* Ams.

This was described from Iran and Turkey in Amsel (1953) and also inhabits Middle Heights in the Iraqi mountains, flying there in June.

671. *Praeepischnia lydella* Led. (= *gypsocrates* Meyr.).

Inhabits Upper Heights, flying there in July.

672. *Epischnia arabica* Ams. (Pl. VIII, Figs. 19, 20).

Described in Amsel (1949, i), this species inhabits the southern deserts and is apparently bivoltine, flying in May and October.

673. *Adelosemia* (?) *crepusculella* Led.

Flies at Upper Heights in late July.

674. *Myelois pumicosa* Led. (Pl. II, Fig. 11).

Inhabits desert foot-hills and dry Middle Heights flying in March in the Dyala region and in June at greater heights.

675. *Myelois circumdatella* Led. (= *ottoella* Schaw.).

Flies at Middle Heights in April–June. Schawerda also recorded it as a new species from near Mosul.

676. *Myelois cribrella* Hübn.

Flies at Upper Heights in July–August. The larva feeds internally in thistles, hibernating in the stems.

677. *Myelois synclina* Meyr.

Described in Meyrick (1936), this species flies at Middle Heights in July–August.

678. *Myelois cinerea* Stgr. (= *Eurodope buxtoni* Roths.).

Inhabits the plains and Middle Heights of the mountains also. The example from which Rothschild described *E. buxtoni* was taken at Amarah in June; it also flies in the desert west of Kerbela in May and at Bagdad in late May. It has been taken at Shaqlawa in July.

679. *Myelois margaritella* Tur.

Inhabits the desert west of Kerbela and flies there in March–May.

680. *Ciliocera leucosarca* Meyr. (Pl. VIII, Fig. 16).

Described in Meyrick (1936) as an *Emmalocera* this species was put in a new genus in Amsel (1953) and further illustrated. It flies at Upper Heights in the mountains in July–August.

681. *Anerastia ablutella* Z. (= *Heterographis buxtoni* Roths., syn. nov.).

Inhabits the plains, both the desert and oases; multivoltine, flying from March to November.

682. *Epidauria discella* Rag.

Inhabits the northern and Southern plain and also Middle Heights of the mountains, flying in June–August.

683. *Ematheudes punctella* Tr. subsp. *vitellinella* Rag.

Inhabits Middle Heights of the mountains, flying there in May, and also the plains, appearing in April in the extreme south.

684. *Shirazia monotona* Ams. (Pl. II, Fig. 12).

Described in Amsel (1953) from a reedy stream near Shiraz this species has been recaptured at Haj Omran, an Upper Height locality where it doubtless breeds in the various swampy meadows and streamsides. Its probable foodplant is reed (*Phragmites*). In S.W. Iran at 5000 ft. this moth flies in mid–June but at 6000 ft. in Iraq it appears in July–August. It is univoltine.

**** 685. *Arenipses sabella* Hamps. (Pl. II, Fig. 13).**

THE GREATER DATE MOTH.

Distributed with the date palm in Central and Southern Iraq; i.e. oases.

It attacks dates, more often the growing date, but occasionally the stored date. In March the young larvae are first found eating the soft tips of the unopened spathes. When the spathe opens the larva turns to the young dates and strips whole strands bare. Its course from date to date is marked by a coarse silk tunnel plastered with frass and date-fragments. When the larva is full-grown the tunnel is 35 cm. long. The moth is commonest in April but is seen on the wing in any month from March to October. (?) Multivoltine.

**** 686. *Galleria mellonella* L.**

THE WAX MOTH.

Although only known as yet from Abu Ghuraib, in the Central Plain, this moth is probably distributed throughout Iraq wherever bees are cultivated; it may perhaps parasitise wild bees' nests too. In old-fashioned bee-hives it can be a destructive pest, but the modern type suffers less.

The larva riddles honeycombs with its silk-lined galleries and spins a cocoon in the comb. Phenology in Iraq uncertain, probably multivoltine.

687. *Lamoria anella* Schiff.

Inhabits oases of the plain and the mountains.

Bivoltine, flying in early summer and again in autumn.

688. *Trepteryx pertusalis* Hübn.

The only record is from Amadia in May, in the northern mountains, at Upper Middle Heights.

689. *Cledeobia consecratalis* Led.

Inhabits Upper Heights of the mountains, flying in June.

690. Cledeobia isthmicalis Led.

Flies in August at 4000 ft. in the mountains of North-west Iraq, and is perhaps more widespread.

691. Actenia honestalis Tr.

Flies in July at Upper Heights of the mountains.

692. Actenia brunnealis Tr.

Flies in October in oases of the Central plain and probably elsewhere.

693. Bostra tristis Butl.

Flies in July–September at Middle and Upper Heights of the mountains.

694. Bostra minimalis Ams. (Pl. XI, Fig. 41; Pl. XVII, Fig. 90).

Described in Amsel (1949, i), this moth inhabits the Mosul region, probably inhabiting deserts. It flies in July.

695. Bostra tacapealis Rag.

Inhabits the Central plain and Middle Heights of the mountains; has so far only been taken on oasis biotopes.

Univoltine, flying in September.

696. Bostra marginalis Roths. (Pl. IV, Fig. 21; Pl. XII, Fig. 43).

This species appears a close relative of the African species *Aglossa basalis* Walker. They seem to be congeneric. It inhabits the Central and Southern plain, in oases.

Bivoltine, flying in March–April, and September–November.

697. Crocalia aglossalis Rag. (= *Aglossa exsculpta* Meyr.).

Inhabits the desert, except alluvial ground, from Mosul district southwards.

Bivoltine, flying in March–April and September–November.

*** 698. Aglossa pinguinalis** L.

Surprisingly, not the subsp. *asiatica* Ersch, which occurs from Egypt to Lebanon, Iran and Turkestan, but a form very like the typical European, inhabits Iraq. It may perhaps be *indistincta* Corbet & Tams 1943, described from Baluchistan.

It has been taken in Bagdad in March–April, but is doubtless widespread in habitations, garden sheds, etc. It is univoltine, and feeds on the refuse of cereals, dried seeds and various kinds of vegetable litter; the blackish larva usually hides in a silken tube in cracks of walls or floors.

699. Krombia pulchella Ams. (Pl. XII, Fig. 44; Pl. XVII, Fig. 97).

Described in Amsel (1949, i) this tiny but beautiful moth inhabits deserts in the extreme south, where it flies in May and October, being bivoltine.

700. Therapne obsoletalis Mén.

Inhabits Middle Heights, flying in June–July.

* 701. *Pyralis farinalis* L. (Pl. II, Fig. 16).

Examples of this moth have been taken in Bagdad in September and at Shaqlawa in May; it probably inhabits all towns and villages from the north to the south.

The whitish larva has similar habits to those of *A. pinguinalis* (No. 698 above); it feeds on stored cereals and refuse of cereals in storage-places. The phenology in Iraq is still obscure.

702. *Pyralis imperialis* Car.

Flies from June to October in the woodland zone of the mountains.

* 703. *Hypsopygia costalis* F.

Very common in and around rural buildings in the mountains.

The larva feeds on stored clover and other fodder. The moth flies from June to August and is presumably univoltine.

704. *Lepidogma wiltshirei* Ams. (Pl. XI, Fig. 40; Pl. XVII, Fig. 91).

Described in Amsel (1949, i) this species inhabits river banks and islands in the Central plain, and is apparently an endemic.

It flies in May and September and one presumes that its foodplant is *Tamarix*, since this is the foodplant of its relative *tamaricalis* Mén. which inhabits South-western Iran and might also one day be found in Iraq.

705. *Dattinia poliopastalis* Hamps.

Widespread in deserts, but local; probably bivoltine, but so far only taken in October.

706. *Dattinia mesopotamica* Ams. 1955.

Inhabits alluvial ground subject to seepage and overgrown with *Suaeda* in the Shatt el Arab oasis area. It flies over this vegetation in April and October, being evidently bivoltine; presumably this salt-bush is its foodplant.

707. *Dattinia iranalis* Ams.

Described from Iraq and Iran in Amsel (1949, ii), this moth inhabits steppe-desert terrain; it is probably bivoltine but has so far only been taken in autumn.

708. *Dattinia canifusalis* Hamps.

Inhabits the Southern and Central plain and desert foot-hills, and is probably bivoltine but has so far only been taken in spring.

709. *Dattinia concatenalis* Led.

Inhabits the desert west of Kerbela, being probably bivoltine; it was taken in May but the locality was not collected later than in June.

710. *Dattinia affinis* Roths.

Described from Kut el Amarah, the type of this moth is a female and is in the British Museum. It was taken in August 1918.

711. *Dattinia sinaica* Reb. f. *debskii* Rebel.

Inhabits the desert west of Basra, whence it extends to Kuwait and Egypt. It is bivoltine, flying in May and November.

(N.B.—*Dattinia simplicialis* Roths. (For this name, see no. 665).

712. *Constantia wiltshirei* Ams. (Pl. XI, Fig. 39; Pl. XVII, Fig. 92).

Described in Amsel (1949, i) this moth inhabits the desert west of Kerbela, where it flies in March–April and probably again in autumn.

713. *Constantia argentalis* Hamps.

Inhabits the desert west of Kerbela and also the neighbourhood of Amarah; it is bivoltine, flying in May and September.

714. *Constantia colchicalis* H.-S.

Inhabits the plain and the mountains, flying in spring and autumn.

715. *Endotricha flammealis* Schiff. subsp. *carnealis* Del.

Inhabits Middle Heights of the mountains, flying there in July. In Europe the typical race is univoltine polyphagous and flies in July.

716. *Crambus paludellus* Hübn.

Inhabits the Shatt el Arab oasis and probably other marshy parts of Iraq. It flies at Basra in May. In Europe the moth is univoltine and feeds on bulrush (*Typha*) which, of course grows commonly in the ditches of the Basra date-palm groves and is widespread in Iraq. Since an example of the moth was taken in the waterless district of Kuwait, it is presumably migratory.

717. *Crambus contaminellus* Hübn.

Inhabits the Middle Heights of the mountains, and flies there in April and June. Since I have taken it also in September in Fars, S.W. Iran, it is probably bivoltine.

718. *Crambus cyrenaicellus* Rag.

This moth has been taken at Mosul in October.

719. *Crambus desertellus* Led. (Pl. VI, Figs. 1, 2).

Inhabits the Northern plain and the mountains, flying in September–October.

720. *Crambus stenopterellus* Ams. (Pl. VI, Fig. 3; Pl. XVII, Fig. 83).

Comes to light commonly in October at Middle Heights in the mountains and in places in the Northern plain.

720a. *Agriphila dalmatinella* Hamps. ssp. *beieri* Blesz.

Though taken by Otto near Mosul in October 1916 this species was only recently identified. The Iraqi race was described in Bleszynski (1955). No other examples from Iraq are known.

721. *Eromene ocella* Haw.

This almost world-wide moth has been taken in March, May, September and November and comes to light in most parts of the Central and Southern plain, both desert and oasis. Its foodplant has not yet been recorded but Meyrick suggested packing straw. On the other hand its appearances suggest it is migratory.

722. *Eromene islamella* Ams.

Described from Iraq and Iran in Amsel (1949, ii) this moth is common in oases and deserts and desert foot-hills from Central Iraq southwards.

723. *Eromene bella* Hübn.

Flies off and on from June to October in the mountains.

724. *Eromene pulverosa* Chr. (?).

Flies in June at Upper Middle Heights of the mountains.

725. *Eromene rayatella* Ams. (Pl. VI, Fig. 4).

Described in Amsel (1949, i) this moth inhabits Upper Middle Heights in the mountains, flying in July.

726. *Talis quercella* Schiff.

A single specimen has been taken on gravel desert near Samarra in October. Since the nearest oak (*Quercus*) tree must have been over a hundred miles distant, the specific name seems very inept. I am unaware of the foodplant, but it must be some desert herb.

727. *Ancylolomia palpella* Schiff. (= *affinis* Roths.).

Widespread in Iraq, but local; it flies at Amarah, in the southern plain, in November; further north it appears a week or two earlier.

728. *Ancylolomia tentaculella* Hübn. (Pl. VII, Fig. 13; Pl. VIII, Fig. 14).

According to Mr. E. L. Martin *A. irakella* Ams. (Fig. 13) is not distinct from typical *tentaculella* (Fig. 14) and Amsel's 1949 name is a synonym. I am also indebted to Mr. Martin for the synonymy of Rothschild's name for the preceding species. The moth flies in October at Middle Heights.

729. *Tollia pectinatella* Z. (Pl. VIII, Fig. 15).

Flies in October at Middle Heights of the mountains.

730. *Aeglotis argentalis* Chr. (Pl. II, Fig. 18).

Flies at Upper Heights, e.g. Haj Omran, in July–August.

731. *Schoenobius gigantellus* Schiff.

Inhabits the plain and probably also the mountains, but is confined to reedy places on oasis ground. It flies in the plain in April–May, probably later at higher altitudes. Foodplant reed (Arab. Qasab; *Phragmites*.) There may possibly be a second brood, but it has not yet been taken.

732. *Schoenobius alpherakyi* Stgr.

Flies commonly in the Southern and Central plain in oases in April and September. It probably feeds on lawn grass and is certainly common in places where there is no reed though also occurring in reedy places.

733. *Schoenobius incertellus* Walk.

Recorded by Rothschild from the Southern plain in May–July. It may be an error for *alpherakyi*; the specimens have not been re-examined.

734. *Diatrea* sp. (Pl. VI, Fig. 6).

This moth is a marsh insect, inhabiting stream-sides, etc., at Middle Heights of the mountains.

It was determined by Meyrick in 1937 as *D. luteella* Motsch., but this is certainly wrong. It is, furthermore, quite distinct from the marsh moth which I took at Amik, Lebanon, and which Meyrick also, wrongly, determined as *D. luteella* Motsch.

735. *Cephis buxtoni* Roths. (= *Chiloides hederalis* Ams.). (Pl. VI, Fig. 5).

Inhabits oases in the southern plain, flying in May and October. Rothschild described the species in a new genus *Archigalleria* which he wrongly placed in the *Galleriinae*; it is a synonym of *Cephis* according to Mr. E. L. Martin.

*** 736. *Chilo suppressalis* Walk.**

Recorded by Rothschild from Amarah, southern plain, in April 1918. Perhaps not correctly determined. The true *Chilo suppressalis* bores in rice-stems in tropical Asia, and the Far East. This would be its westernmost limit, if confirmed.

737. *Thyridophora furia* Swinh.

Inhabits deserts and Middle Heights of the mountains, flying in May–June and August–September.

738. *Scoparia phycophanes* Meyr. (Pl. X, Fig. 34).

Flies in June at Middle Heights of the mountains.

739. *Scoparia rupestris* Meyr. (Pl. XI, Figs. 37, 38).

Inhabits desert foot-hills, the Northern plain, and up to Upper Heights of the mountains, and flies in April, May and October in the plains, and in July, August and October in the mountains. Both this and the preceding were described in Meyrick (1936).

740. *Scoparia piroformis* Ams. (Pl. X, Fig. 35).

Described in Amsel (1949, i), this moth flies in October at Middle Heights of the mountains.

741. *Nymphula affinialis* Guen.

Inhabits the plains from south to north, and up to at least Middle Heights of the mountains. Multivoltine, one of Southern Iraq's most abundant moths. Though doubtless breeding in oases it has been found in the desert west of Basra probably being blown

southwards from the lakes and marshes. This genus has aquatic larvae. At Bagdad an aquatic larva feeding on *Potamogeton* has been captured; it was probably this species; but we failed to rear it to the adult.

* 742. *Hymenia fascialis* Z. (= *recurvalis* F.).

This moth flies by day and appears in the plain in October and November. The moth is a Holotropical pest on beet; it also feeds on various weeds and root-crops. In the western hemisphere it is called the Hawaiian Beet Web-Worm. It seems to be an immigrant into Iraq, or at least Central Iraq, from further south.

743. *Synclera traducalis* Z.

Appears commonly at Middle Heights in August and September and occasionally in the Northern plain in October. Its appearances suggest that it is migratory, but this is contradicted by its never having been recorded from the centre and south of Iraq.

744. *Euclasta splendidalis* H.-S.

Flies in late June at Middle Heights of the mountains.

745. *Ercta ornatalis* Dup.

Inhabits oases of the plain, flying in October.

746. *Duponchelia fovealis* Dup.

Inhabits oases in the Southern plain, flying in April and October.

747. *Parastenia bruguieralis* Dup.

Inhabits Middle and Upper Heights of the mountains, flying from June to October.

748. *Parastenia intervacatalis* Chr. (= *Leptarchis psologramma* Meyr.).

A common autumnal moth at Middle Heights of the mountains, sometimes penetrating desert foot-hills.

749. *Mecyna polygonalis* Hübn.

Flies from July to October, being especially common in July, at Middle Heights of the mountains. It was also taken at Amarah in September 1916 by Buxton. The majority of specimens are f. *gilvata* F.

750. *Nomophila noctuella* Schiff.

This multivoltine migrant occurs everywhere in Iraq, though not at all seasons. The larva feeds on low herbs.

* 751. *Pachyzancla licarsisalis* Walker.

Inhabits oases, flying from October until March, but commonest in autumn. It feeds on roots of lawn grass, and other grasses.

752. *Prochoristis rupicapralis* Led.

Inhabits steppe desert in the northern plain and west of Kerbela; also up to Middle Heights in the mountains. Univoltine, flying in May-June. Probable foodplant: *Capparis*.

753. *Stiphrometasia sancta* Hamps.

Inhabits gravel deserts and Middle Heights of the mountains, on dry ground. Bivoltine, flying in April–May and in October in the plain; at Middle Heights it has also been taken in July.

754. *Epactotena octogenalis* Led.

Flies at Upper and Middle Heights of the mountains in June–July.

755. *Metasia virginalis* Rag. (= *Cirrhochrista phthoneropsis* Meyr.).

Inhabits deserts, other than alluvial, and Middle Heights, flying in June–July.

756. *Metasia mendicalis* Stgr.

Flies in the autumn at Middle Heights.

757. *Metasia ochrifascialis* Chr.

Recorded by Rothschild as taken in August at Kut, in the Central plain.

758. *Metasia ossealis* Stgr.

Recorded by Rothschild as taken in June at Amarah, in the Southern plain.

759. *Metasia suppandalis* H.-S. ssp.

A paler race than the typical flies at Upper Heights of the mountains in July–August.

760. *Cybolomia haplogramma* Meyr. (Pl. XII, Fig. 49; Pl. XVII, Fig. 93).

Described in Meyrick (1936), this moth flies in the deserts, other than alluvial, of the Northern plain and west of Kerbela, in April–June.

761. *Cybolomia triplacogramma* Meyr. (Pl. XVII, Fig. 94).

Inhabits the Middle Heights of the mountains, and is bivoltine, flying in early summer and autumn.

762. *Cybolomia pentadalis* Led.

Flies in stony deserts and also up to Middle Heights of the mountains, appearing in three broods between March and October. It also occasionally appears in oases of the plain.

*** 763. *Antigastra catalaunalis* Dup.**

This migrant appears at Middle Heights from August to November. It feeds on the flowers of sesame.

764. *Psammotis pulveralis* Hübn.

Flies at Upper Heights in June–July.

*** 765. *Hellula undalis* F.**

This little moth, whose larva feeds on *Cruciferae* and is sometimes injurious to vegetables, inhabits the whole of Iraq from North to South and flies in successive broods from April to October.

766. *Loxostege scalaris* Christ.

Flies in the desert west of Kerbela in June.

**** 767. *Loxostege nudalis* Hamps. (Pl. II, Fig. 15).**

This moth has been bred from larvae attacking beet at Abu Ghuraib. It is common on the wing in oases of the central plain from April till September. It also feeds on *Amaranthus graecizans*.

768. *Loxostege emiralis* Ob.

This moth has been taken on low ground subject to seepage and overgrown with salt-bush (*Suaeda*) at Basra in April.

769. *Evergestis caesialis* H.-S.

Flies at Upper Heights of the mountains in September.

770. *Evergestis desertalis* Hübn. f. *zernyi* Schaw.

Inhabits the Northern plain and desert foot-hills, flying in spring, and again in autumn.

771. *Evergestis isatidalis* Dup.

Flies in oases of the Central plain from November to January.

772. *Trigonuncus evergestalis* Ams.

Described in Amsel (1953) from Iran, where it is widespread, this moth also inhabits desert foot-hills in the Dyala province; it is bivoltine, coming to light in April-May and again in October.

773. *Phlyctaenodes pustulalis* Hübn.

Inhabits Sheikh Adi, a wooded corner in the lower hills of N. Iraq, and flies there in June. Probably more widespread in the woodland zone, and perhaps the Northern plain. The larva mines in *Anchusa* leaves.

774. *Phlyctaenodes cruentalis* Hübn.

Inhabits the mountains, flying at Middle Heights in May and at Upper Heights in June.

775. *Phlyctaenodes sinuosalis* LeCerf (= *platyphaea* Meyr.) (syn. nov.) (Pl. XVII, Fig. 102.)

This moth was described in LeCerf (1913) and illustrated in Pl. I, fig. 11 thereof. Meyrick redescribed it under the genus *Loxostege*, and his name must sink to LeCerf's. Amsel (1949, i) transferred it to *Phlyctaenodes*. The moth flies by day in the Zagros woodland zone from near Amadia south-eastwards to Fars in S.W. Iran. In Iraq its time of flight is June at 4000 ft. and July at 6000 ft. At the latter height in Iraq it is above the tree limit. It is commoner in the Persian Zagros than in Iraqi Kurdistan.

776. *Phlyctaenodes foviferalis* Hamps.

Inhabits the Central plain, the desert foot-hills and Middle Heights of the mountains, and is probably even more widespread. Univoltine autumnal, flying from September to November. The larva mines in heliotrope foliage.

777. *Pionea languidalis* Ev.

Inhabits Upper Heights (5000–6000 ft.), flying in June–July.

778. *Pionea ferrugalis* Hübn.

Inhabits the plain and the mountains. Foodplant: *Verbascum*, *Calendula*, and doubtless other herbs. Multivoltine, migratory.

779. *Pionea confinalis* Led.

Flies commonly on wet ground at Upper Heights in June–July. Foodplant: thistle leaves.

780. *Pionea perfervidalis* Hamps.

Flies in the Central plain in April–May. Has been taken only in oases.

781. *Pyrausta amasialis* Stgr.

Flies in May–June in the Northern plain and at Middle Heights of the mountains.

782. *Pyrausta limbopunctalis* H.-S.

Flies at Upper Heights of the mountains in June–August.

783. *Pyrausta incoloralis* Guen.

Flies in the plain usually in November; what seems to be a first generation is occasionally seen in April.

784. *Pyrausta praepetalis* Led. (= *Oeobia haemopsamma* Meyr.).

Flies at Upper Middle Heights and Upper Heights of the mountains in June–July.

785. *Pyrausta trinalis* Schiff. subsp. *pontica* Stgr.

Inhabits the northern plain and the mountains up to great heights, and flies in June–July.

786. *Pyrausta virginalis* Dup. f. *auroralis* Z.

Inhabits the Northern plain and the mountains, flying in May–June. Foodplant: *Salvia*.

*** 787. *Pyrausta meridionalis* Stgr. (Pl. II, Fig. 17).**

In some countries, e.g. Morocco, where mint is cultivated as a herb for flavouring, this moth has been recorded as a pest; in Iraq it inhabits the Middle Heights of the mountains and is multivoltine. Its foodplant is wild mint (*Mentha*). It is multivoltine, and appears from May to October.

788. *Pyrausta cespitalis* Schiff.

Inhabits oases of the plain and also the mountains. At such places as Amarah it flies in March–April. At Middle Heights what appears to be a second brood flies in late August. The foodplant elsewhere is known to be plantain (*Plantago*).

789. *Pyrausta lutulentalis* Led.

Inhabits Upper Heights and is more local at Middle Heights; it flies in July–August.

790. *Pyrausta gutturalis* Stgr.

Inhabits Upper Heights and probably also oases at Middle Heights. It seems to be bivoltine in Fars, flying there in June and September. In Iraq its flight has been observed in July–August at Haj Omran (Upper Heights). The foodplant was observed in the Lebanon as honeysuckle (*Lonicera*).

791. *Pyrausta verbascalis* Schiff.

Flies in August at Middle Heights of the mountains, and probably also earlier in the years.

792. *Cornifrons ulceratalis* Led.

Widespread in the plain inhabiting deserts and foot-hills, and also occurring less commonly in oases. It flies in Iraq in two generations, in March–April and November. This is one of the desert's commonest moths.

793. *Noctuelia floralis* Hübn.

Widespread in the plain and the mountains, both in deserts and oases. It is multivoltine from May to October.

794. *Tegostoma mossulalis* Ams. (Pl. XII, Fig. 46).

Described in Amsel (1949, i) this moth flies at Mosul in June.

795. *Tegostoma lepidalis* H.-S.

This beautiful moth has been taken in July at Upper and Middle Heights but probably might also be taken earlier in the year.

796. *Anthophilopsis baphialis* Led. (Pl. XVI, Fig. 82, b).

Inhabits the plain and mountains, both desert and oasis, and is multivoltine flying from early spring to autumn.

797. *Aeschremon disparalis* H.-S. (Pl. XVI, Fig. 82, c).

Inhabits the plain, where it has been taken both at night, and flying by day over capers (*Capparis*). It seems to be bivoltine, flying in March–April and September–October.

798. *Emprepes russulalis* Chr. (= *Noctuelia baryscia* Meyr.). (Pl. XVI, Fig. 82, g).

Inhabits the plain and up to Middle Heights of the mountains. It inhabits principally deserts and steppes. It is univoltine, flying in spring.

799. *Emprepes eoa* Meyr.

Described in Meyrick (1936) this moth was transferred to this genus in Amsel (1955). It inhabits Middle and Upper Heights of the mountains, especially the latter, in June–July.

800. *Kerbela monotona* Ams. (Pl. XII, Fig. 48; Pl. XVI, Fig. 82, d).

Both genus and species were described in Amsel (1949, i). The moth flies in the desert west of Kerbela in May and is probably more widespread on steppe desert terrain and perhaps Middle Heights.

801. *Cynaeda gigantea* Wck.

Flies at Middle Heights in two broods, in May–June and again in August. At Upper Heights it is very common in July–August at light. Since its European relatives attack *Echium*, the foodplant here is probably some species of that genus or some other boraginaceous herb.

Super-family: GELECHIOIDEA

Family: SCYTHRIDAE

**** 802. *Syringopais temperatella* Led.**

Inhabits the plain and the mountains. In the former it flies in April–May, and at Middle Heights in May–June. It flies by day in wheat-fields and barley-fields, and the minute caterpillars hatch from the ova shortly after this. They spend the summer in the soil in diapause (aestivation) and feed up during the season of winter rains. Their mines in the wheat leaves are sometimes conspicuous, and the moth is considered a serious cereal-crop pest in mountainous districts of the Middle East. Modern-style ploughing is said by Bodenheimer (1935) to exterminate the aestivating larva. This small sooty moth, with metallic brown upper wings, was illustrated in that work. It also feeds on wild grasses.

803. *Scythris bagdadiella* Ams. (Pl. XV, Fig. 69; Pl. XVII, Fig. 101).

Described in Amsel (1949, i), this little moth flies in April in oases of the Central plain. The only known examples of it have been reared from larvae found in the autumn on tamarisk (*Tamarix*), and it is presumably therefore an inhabitant of river banks and islands in Iraq. My hitherto unpublished description of this larva runs as follows: a quick moving, small, olive-green or olive-brown larva with a blackish collar consisting of a transverse and laterally oblique band on somite 2; somite 3 is unmarked; somites 4–11 each bear a darker olive or blackish subdorsal mark; the head is olive-brown mottled with black. The spiracles, set in a pale lateral area, are black; the thoracic feet are black; the abdominal feet are of the general ground colour.

804. *Scythris lychnitis* Meyr.

Described in *Exotic Microlepidoptera*, Vol. 2, from an example taken in Basra in September, this moth remains a mystery and Amsel (1949, i) suggests that it is not a relative of the above.

805. *Metzneria castiliella* Moeschl.

Flies in March in the desert near Nejf.

806. *Metzneria diamondi* Ams. (Pl. XIV, Fig. 63).

Described in Amsel (1949), this little moth flies in March in the desert west of Kerbela.

807. *Bagdadia irakella* Ams. (Pl. XIV, Fig. 64; Pl. XVI, Figs. 78, 79; Pl. XVII, Fig. 99).

Described in Amsel (1949, i), this little moth also flies in March in the desert west of Kerbela.

Family: MOMPHTIDAE

**** 808. *Batrachedra amydraula* Meyr.**

Illustrated and described best in Corbet and Tams (1943) this moth is there stated to be a pest on dried fruit in stores. It was originally described from N. India, and in Iraq is distributed with the date palm in the Southern and Central plain. It flies in two or three generations from April to early July, attacking the growing date. According to Rao, the larvae of the last generation overwinter inside their cocoon before pupating. The minute larvae are responsible for the red condition of the dates known as "Humairah" but are not responsible for all falls of immature dates, or all cases known as "Hashshaf". According to Dowson the larva, before entering a date, attaches it by a cord to a neighbouring date, or to the stalk, according to Rao. The only trace it leaves, other than the resulting condition of the date, is the small hole of entry close to the calyx. From this entry-hole it works its way inside the date towards the stone or seed, thus severing the latter from the stalk. It may enter three or four dates during its period of growth, and does not attempt to eat the whole of each date. Its ravages are less conspicuous than those of *Arenipsectes sabella* (No. 685, above). When full-grown the larva is white and 12 mm. long. The wild place of pupation has not yet been observed, but in captivity the cocoon is often formed along the stalklet of the date-bunch. The cocoon is pale yellow, pointed at each end, and about 15 mm. long. The moth, perhaps because of its small size, is seldom seen flying wild. In Bagdad I have taken it in houses. It may therefore also feed on stores and debris.

*** 809. *Pyroderces philocarpa* Meyr.**

This moth was also described in *Exotic Microlepidoptera*, Vol. 2, from material from Basra; the type was bred by Rao in April from a maggot found in fallen dates in the previous December. I can find no further reference to it, and do not know whether it may be as serious a pest as the preceding species.

810. *Limnoecia combota* Meyr.

This moth, described in the same volume as the two preceding, comes to light in May in Basra, but has not been recaptured since Rao took it about forty years ago. (Probably it is a *Stigmatophora*, since Amsel has stated that *Limnoecia copidobathra* Meyr. is a synonym of *Stigmatophora fulguritella* Led.).

Family: GELECHIIDAE

811. *Ethmia pusiella* Roem. (Pl. IV, Fig. 24).

This moth inhabits Middle Heights of the mountains and also oases of the plain as far south as Bagdad.

Foodplant: *Asperugo procumbens*, which grows in certain orchards not uncommonly. In the plain the larva is full-grown in February and the moth flies in October–November; the same univoltine phenology has also been observed up to 5000 ft. (Shiraz) in the South Zagros. In Iraqi Kurdistan however, a spring brood flies in April, the form having a grey

abdomen and hindwing, in addition to the autumnal brood, appearing in September–October, and consisting of forms with pure white abdomens and hindwings. This also seems to be so in East Turkey (see Osthelder, 1935, p. 79). Osthelder there calls the greyish spring form *ardosiella* Car. and the second brood *orientella* Car. The Bagdad and Shiraz forms appear to belong to the latter. It is remarkable however that the phenology should differ in the two regions (i) Marash-North Zagros, and (ii) Central Iraq-South Zagros. If Dr. Amsel had not determined the Shaqlawa moth as *pusiella* I should be inclined to suspect that *ardosiella* Car. was a separate species. Perhaps observation of the life-cycle in the north will solve this enigma.

811a. *Ethmia caradjae* Reb.

Flies in June at Upper Heights. Anatolian-Iranian.

812. *Ethmia bipunctella* F.

Inhabits Middle and Upper Heights. At the latter the race *griseicostella* Wilts. predominates; it extends into Persia.

Foodplant: *Echium*. In Iran, and probably also in Iraq, the moth is trivoltine, flying in May, July, and October. The larvae do not over-winter, as do those of the preceding species, but attain full-growth in late November. The gay colours make this and the preceding species' larvae more attractive than most of this and neighbouring families.

813. *Ethmia confusella* Rebel.

Described by Rebel from Mardin (East Turkey), in *Iris*, Vol. 13, as a local form of *bipunctella*, the preceding, this moth is now considered distinct. It flies at Middle Heights in the Iraqi mountains in April and probably later in the year also. A female taken at Shaqlawa is remarkable for the the grey clouding of the forewing inner margin.

814. *Ethmia quadrinotella* Mén.

Flies in the desert west of Kerbela in March.

815. *Ethmia lepidella* Chrét.

Flies in the desert foot-hills of the Dyala province in November.

816. *Depressaria obolucha* Meyr. (Pl. XIII, Fig. 57).

Described in Meyrick (1936) this moth inhabits Middle Heights of the mountains, and has been taken in July.

(N.B.—*Depressaria mesopotamica* Ams. (Pl. XIV, Fig. 58) was described in Amsel (1949) from the Persian desert foot-hills but has not yet been taken in Iraq.)

817. *Depressaria xyleuta* Meyr. (Pl. XIV, Fig. 59).

Described in *Exotic Microlepidoptera*, Vol. I, p. 115, this moth inhabits the Northern plain and the mountains, and is on the wing in May, June and September.

818. *Schistodepressaria rutilcola* Chr. (= *Mnemogenes melitophaea* Meyr.).

Flies in the Northern steppe desert in June. Its foodplant in the Jordan valley was observed to be *Haplophilum longifolium*.

819. *Nothris verbascella* Hübn. ssp. *clarella* Ams.

Inhabits the desert foot-hills in the Dyala province and doubtless also the Northern plain and mountains.

Foodplant: *Verbascum*, burrowing in the heart before the stems grow tall. In Central Iraq the larva is full-grown in late March and flies in late April, but further north and at higher altitudes these dates will naturally be later. On the Persian plateau the moth flies in June. It seems to be univoltine.

*** 820. *Anarsia aleurodes* Meyr.**

Bred by Rao from galls on poplars (*Populus*) at Museyib, and described in *Exotic Microlepidoptera*, Vol. 2, this moth has not been taken again but presumably inhabits oases, particularly river banks, in the plain.

821. *Gelechia bathrosticta* Meyr. (Pl. XIV, Fig. 65; Pl. XVI, Fig. 77).

Described in Meyrick (1936) this moth flies in the Northern desert in June.

822. *Gelechia astragali* Stgr.

Inhabits Upper Heights of the mountains where it flies in July; it probably also inhabits lower altitudes.

823. *Gelechia plutelliformis* Stgr.

Inhabits river banks and islands in the plain, flying in several generations from May to September. Foodplant: tamarisk (*Tamarix*).

824. *Gelechia magnetella* Stgr.

Flies at Middle Heights in June.

825. *Telphusa ostentella* Zy.

Inhabits Upper Heights of the mountains, flying in July. It was described by Zerny in *Iris*, Vol. 47 (1933).

826. *Onebala lamprostoma* Z.

Flies in the Northern plain in October.

827. *Pseudoteleia squamodorella* Ams.

Described in Amsel (1935, i) from Jericho, this moth also flies in Bagdad in March. The Jericho examples were bred from larvae on *Populus euphratica* and were taken in April and July. Presumably therefore the moth is an inhabitant of the river banks and islands of the plain and is at least bivoltine.

828. *Asbolistis chthoniopa* Meyr. (Pl. XV, Fig. 66; Pl. XVI, Figs. 80, 81).

Described in Meyrick (1936), this moth flies at Upper Heights of the mountains in July.

Family: OECOPHORIDAE

829. *Pleurota kerbelella* Ams. (Pl. XIV, Fig. 60).

Described in Amsel (1949, i), this moth flies in the desert west of Kerbela in March.

830. *Pleurota generosella* Rebel. (= *alexandrina* Meyr.) (Pl. XIV, Fig. 61).

Common in the Western and Northern deserts, flying in May west of Kerbela, and in June north-west of Mosul.

831. *Pleurota wiltshirei* Ams. (Pl. XIV, Fig. 62).

Described in Amsel (1949, i) this moth is widespread in deserts in the south-west and south, flying in March–April.

832. *Pleurota idalia* Meyr.

This day-flier is a relative of, perhaps identical with, *P. pyropella* Schiff. It was described from Cyprus. It flies in spring and is common in "daim" wheat-fields in the desert foothills and in grassy places at Middle Heights of the mountains. It seems to be univoltine and its biology is unknown. It is distinguishable from No. 802 above by its streaked white and brown forewing and dark grey hindwing.

833. *Symmoca kalifella* Ams. (Pl. XIII, Fig. 56).

Described in Amsel (1949, i) this moth seems to be widespread in the Central and Southern plain, inhabiting both desert and oasis, and flying in March and September.

834. *Symmoca sparsella* Joann.

Flies at Middle Heights in August–October.

835. *Symmoca costobscurella* Ams. (Pl. XIII, Fig. 55).

Described in Amsel (1949, i) from Ahwaz, South-west Persia, this moth also inhabits the south of Iraq, where it flies in May and September, both in the Shatt el Arab oasis and in the desert to the west thereof.

836. *Oegoconia quadripuncta* Haw.

Flies in November in orchards in oases of the Central plain.

837. *Bryotropha arabica* Ams. (1951).

Described in *Fragmenta Entom.* I, p. 120, this moth also flies at Middle Heights of the Iraqi mountains in May.

838. *Apiletria purulentella* Staint. (= *Aretascetis endoperca* Meyr.).

Widespread in the plain and mountains. In the deserts of the south-west it flies in May; in deserts and parts of oases in the Central plain, in May–June; and at Middle Heights it flies in June.

Family: COLEOPHORIDAE

839. *Coleophora kurdistanella* Ams. (1955).

This moth flies at Middle Heights of the mountains in April.

840. *Coleophora cerinaula* Meyr. (1936).

Flies in May at Middle Heights; Amsel suggested that the name should be cancelled owing to the bad state of the type surviving the war; but the description is fairly clear and seems quite different from the preceding and moreover there may be a second example in the Meyrick collection.

841. *Ensepastra machimopis* Meyr. (Pl. XV, Fig. 67).

Flies at Middle Heights of the mountains in May.

Family: PTEROPHORIDAE

842. *Agdistis tamaricis* Z. (= *bagdadiensis* Ams.) (Pl. XII, Fig. 50; Pl. XIII, Fig. 51).

This moth is an inhabitant of river banks and islands in the Central plain, where it feeds on tamarisk. There are at least two generations, flying in May and July.

(The genitalia drawings in our plate deserve the attention of all microlepidopterists, since they correct the erroneous drawing published in Pierce (1938) which showed the genitalia as perfectly symmetrical. In fact the European, like the Bagdad, species has asymmetrical male genitalia, and the two are conspecific, although Amsel in his (1949, i) work not unnaturally supposed they were distinct species, supposing Pierce to be accurate.)

843. *Emmelina monodactyla* L.

Flies in the mountains at Middle Heights in May. There is presumably a second generation in Iraq as in Europe. The larva is polyphagous on low herbs, preferring *Convolvulus* in Britain. It has not yet been observed in Iraq.

844. *Pterophorus terrenus* Meyr.

This moth, described in Meyrick (1936) flies at Upper Heights of the mountains in June.

845. *Oxyptilus laetus* Z.

Flies in July at Middle Heights of the mountains.

846. *Marasmarcha leucocrossa* Meyr. (Pl. XVII, Fig. 96).

This moth, described in Meyrick (1936), flies at Middle Heights of the mountains in May.

847. *Alucita ischnodactyla* Tr.

Flies in oases of the Central plain in October, probably a second generation.

848. *Buckleria siceliota* Z.

Flies in oases of the Central plain in September.

Family: HYPONOMEUTIDAE

849. *Plutella megapterella* Bent.

Flies in deserts near Nejf in March.

**** 850. *Plutella maculipennis* Curt.**

THE DIAMOND-BACK MOTH.

This migrant is common in the plain in March–April, both in oases and deserts. The many kinds of wild cruciferae there flourishing at this season doubtless provide it with its foodplant and opportunity to multiply. In some places it is known as a pest on cabbages, etc.

851. *Cerostoma indecorella* Rebel.

Flies in the desert west of Kerbela in March.

Super-family: TINAEOIDEA

Family: PSYCHIDAE

852. *Amicta murina* Klug. ssp. *albescens* Stgr.

Flies in the South-western deserts in November.

853. *Amictoides villosa* Brandt. (comb. nov.).

Flies at Middle Heights of the mountains in August–September.

854. *Amictoides shahkuhensis* Heyl. (comb. nov.).

Flies at Upper Heights from July to September.

Family: TORTRICIDAE

855. *Oxypteron impar* Stgr.

Flies in November in the desert foot-hills of the Dyala province.

856. *Cnephasia argentana* Cl.

Flies at Upper Heights in late July.

857. *Cnephasiella kurdistana* Amsel (1955).

This moth inhabits oases at Middle Heights of the mountains. The larva feeds on water-mint (*Mentha*) in April, deforming the young leaf-shoots by tying them together. The moth hatches in April–May.

*** 858. *Cacoecia rosana* L.**

Inhabits oases of the Central plain and at Middle Heights, flying in June. Polyphagous; attacks apple foliage, etc.

859. *Tortrix viridana* L. (Pl. I, Fig. 13).

Flies in the woodland zone of the mountains in May. Foodplant: oak (*Quercus*). It flies at Haj Omran in June. This may indicate that there is a second foodplant, or perhaps

merely an upward emigration from the scrub-oak zone. In Europe it is known to defoliate trees not infrequently.

860. *Tortrix asinana* Hübn.

Flies in April in the woodland zone of the mountains.

861. *Tortricomorpha shaqlawana* Amsel (1955).

Flies at Shaqlawa, an oasis in the woodland zone at 2500 ft. altitude, in April, and at Haj Omran (5750 ft.) in June.

862. *Polychrosis artemisiana* Z. (= *glebifera* Meyr.).

Flies at Shaqlawa and doubtless elsewhere in the mountains in July.

863. *Bactra lanceolana* Hübn.

Widespread in the plain, inhabiting oases and flying from February to October in successive broods.

864. *Bactra venosana* Z.

Less common than the preceding, but with a similar distribution in Iraq, and also known from desert foot-hills.

865. *Eucosma esmodes* Meyr. (Pl. XIII, Fig. 52).

Flies in May at Middle Heights of the mountains.

866. *Laspeyresia tricentra* Meyr. (det. Meyrick).

Flies at Middle Heights of the mountains in October.

867. *Phalonia chionella* Schaw.

Flies in May at Middle Heights and also inhabits the Northern plains.

868. *Euxanthis straminea* Haw.

Flies in May at Middle Heights of the mountains.

869. *Sparganothis pilleriana* Schiff.

Flies in May at Middle Heights of the mountains.

870. *Semasia bagdadiana* Ams. (Pl. XIII, Fig. 53; Pl. XVII, Fig. 98).

This moth described in Amsel (1949, i), inhabits river banks and islands in the Central plain and flies in at least two broods from April to July. The foodplant is probably *Populus euphratica*.

871. *Gypsonoma euphraticana* Ams.

Described from the Jordan valley in Amsel (1935, i), this little moth also inhabits oases of the Central plain, and in particular river banks of the Tigris and Shatt el Arab. Foodplant: *Populus euphratica*. It flies in April and October, and seems to be bivoltine.

872. *Argyroploce variegana* Hübn.

Flies at Middle Heights of the mountains in May. Polyphagous.

*** 873. *Lobesia botrana* Schiff.**

Flies in April at Middle Heights of the mountains. The larva feeds on grapes of the vine.

Family: GRACILLARIIDAE

874. *Acrocercops conflua* Meyr.

This minute moth comes to light in Bagdad and is probably more widespread. It has been taken in June but is probably multivoltine. The larva mines in castor (*Ricinus*) foliage.

*** 874a. *Lithocolletis* sp.**

This species, not yet diagnosed, inhabits oases of the central plain; it may well be a new species.

It feeds on the foliage of apple (*Pyrus malus*) (Arab. *tuffah*), forming blisters in the centre of the leaf which curls over somewhat. The pupa is formed in the blister. The minute moth emerges in March; number of generations unknown.

Family: ATYCHIIDAE

875. *Atychia mesopotamica* Ams. (Pl. XIII, Fig. 54).

This moth flies in early morning sunshine in July at Middle Heights of the mountains.

Family: AEGERIIDAE

*** 876. *Eusphecia pimplaeformis* Ob. (Pl. I, Figs. 16, 17).**

Only known from Badgad, but doubtless inhabiting oases thence northwards and perhaps southwards, though it seems absent from the Shatt el Arab. It inhabits principally river banks and islands.

Foodplant: *Populus euphratica*; probably also on other species of poplar and willow (*Salix*). Univoltine. In the Central plain the moth flies in the first half of April, or even in March after a mild winter (as in 1954). Further north it will doubtless emerge somewhat later. The larva eats the healthy wood of the tree-trunk, inside which it bores. In March, when full-grown, it brings its upward-running gallery towards the exterior of the trunk, and often the gallery runs for several inches just under the bark. In these cases, if the exit is noticed, the pupa can be captured; but in other cases it may be impossible to extract it from the tree without causing damage. The pupa is mobile inside its gallery and retreats from the exit if alarmed, movement being effected by wriggling, with the half-rings of abdominal spines. (See LeCerf (1937) for details of these spines and other morphological points.) The pupa is usually head-up in the gallery. The exit-hole from which the moth emerges, leaving the empty pupa-case conspicuously protruding from the trunk, is difficult to find before emergence, since the larva, in excavating it, leaves the outer layer of bark intact, and behind this "window" spins a fine silk curtain. Before pupating the larva also constructs a wad, formed of chewed black fragments of wood, blocking the gallery three or four inches from the exit. Between window and wad the pupa can move up and

down, which may help it to escape woodpeckers or other enemies; some pupae have in this way escaped me and retreated into the heart of the tree. In places where there is a little wood of fair-sized trees one may find in April as many as a dozen empty pupa-cases protruding from each of several trees, at any height up to two metres. If the trees were of greater value the moth might be reckoned a timber pest, and if poplar is methodically cultivated in Northern Iraq may yet become so. The wasp-like moth is best found in the early morning; the female, because of her habit of ovipositing on the trunks, is more often seen than the male, which may sometimes be seen flying upwards into the foliage.

Anatolian-Iranian.

877. *Dipsospecia palariiformis* Led.

Inhabits the woodland zone of the mountains.

Flies in June and is probably univoltine.

Anatolian-Iranian.

878. *Chamaespecia doryceraeformis* Led.

Flies in July at Upper Heights of the mountains.

Anatolian-Iranian.

Family: TINAEIDAE

879. *Trichophaga abruptella* Woll.

Despite the statement in Corbet and Tams (1943) that this moth's food is unknown but "probably carpets, clothing, furs, and other dried animal and vegetable matter" like the food of a congeneric cosmopolitan pest, *T. tapetzella* L., the few existing local records of its occurrence seem to indicate that it is an out-door moth, living far from buildings. The possibility remains that it feeds on fur, etc. in animals' burrows. It has at least two generations in the Middle East, having been taken by me in a Bagdad orchard in October and also in desert foot-hills in May.

880. *Myrmecozela diacona* Wals. ssp. *insignis* Ams. (*Cronodoxa stichograptia* Meyr.).

Flies in the Central plain in March.

881. *Monopis meleodes* Meyr.

Described in *Exotic Microlepidoptera*, Vol. 2, this moth also inhabits Middle Heights of the mountains, flying there in May.

882. *Catabola aegyptiella* Rebel.

Flies in October at Middle Heights of the mountains.

883. *Tinaea irakella* Ams. (Pl. XV, Fig. 70).

Flies in March in desert foot-hills of the Dyala. Described in Amsel (1949, i).

*** 884. *Tinaea fuscipunctella* Haw.**

This moth is best described and illustrated in Corbet and Tams (1943); it has been taken in a Bagdad house from December to April and probably is much more widespread and multivoltine. Food: "dried fruit, dried animal and vegetable materials."

885. *Rhodobates atactopis* Meyr. (Pl. XV, Fig. 74).

Flies in March in the Central plain, and in May in the mountains. It was described in Meyrick (1936).

886. *Hapsifera asiatica* Ams. (Pl. XV, Fig. 72).

Described in Amsel (1949, i), this moth is widespread in Iraq, inhabiting chiefly deserts and steppes, both in the plain and the mountains, and flying from March to May in the former and from May to June in the latter at Middle Heights.

887. *Hapsifera kerbelella* Ams. (Pl. XV, Fig. 73).

Described in Amsel (1949, i), this moth flies in April–May in the desert west of Kerbela.

888. *Hapsifera baliopsamma* Meyr.

Described in *Exotic Microlepidoptera*, Vol. 2, this moth has only been taken in the Northern desert flying in April.

Family: GLYPHIPTERYGIDAE

889. *Klimeschia lutumella* Amsel (1955).

Flies in April at Middle Heights of the mountains.

890. *Simaethis nemorana* Hübn.

Flies in April at Middle Heights of the mountains.

Family: COSSIDAE

*** 891. *Cossus cossus* L.** (Pl. V, Figs. 1–5).

THE GOAT MOTH.

Inhabits the mountains where trees grow. Above the woodland zone it inhabits oases only; in the tree-zone it is more widespread.

The larva bores in the wood of various kinds of tree. It is most often found in old trees of little value but might well damage useful trees too. At Upper Heights, e.g. Haj Omran, the old willow trees are doubtless riddled with its galleries. At Middle Heights it probably feeds in both willow (*Salix*) and oak (*Quercus*).

Euro-Siberian.

In Iraq at least two races of this moth occur, one characteristic of Upper Heights, the other of Middle Heights. Both differ from *cossus* forms from neighbouring districts; the subsp. *armeniaca* Roths., inhabiting the Lebanon and Taurus, and the subsp. *hyrcana* Christ., from Elburz Mts., are both more like the typical European race than are these two Iraqi races, which are described hereunder. At Shiraz, in the S. Zagros, a more ordinary-looking race also occurs.

***Cossus cossus omrana* subsp. n.** (Pl. V, Figs. 4, 5).

This is the smaller of the two Iraqi races, and the more variegated and variable. In a long series one will find one or two individuals resembling the following form, but on

the whole this race is strongly marked with contrasting pale and dark patches and numerous black striae; only one specimen is dark and monotonous.

Span (♂♂ only): 55–61 mm.

Holotype and paratypes: six males, IRAQ, Haj Omran, (c. 6000 ft.), end July to beginning August (in coll. m.).

Cossus cossus kossai subsp. n. (Pl. V, Figs. 1–3).

This race is slightly smaller than the typical, and is characterised by the contrast between a limited dark area and the pale grey ground-colour of most of the forewing. The striae (small dark wavy lines) are less numerous and less uniformly spread over the forewing.

Collar pale grey, bordered with yellow-white. Thorax, pale grey marked with black. Abdomen sooty, banded with whitish, but with underside uniformly pale grey.

Forewing pale grey with a few clear black lines, except on the costa, where they are short and more numerous, and with a fuscous suffusion confined, in most cases, to an area two or three mm. wide, after the discocellular vein and before the longest black line, and in no case reaching the hind margin. In one specimen, where there is more extensive fuscous suffusion, the subapical area is left conspicuously pale, as in all the others. Some examples have traces of a wavy black ante-medial line. From the point where nervure 3 leaves the cell there is usually a fine black line running to the centre of the hind-margin; in one specimen this line is marked on the right, but not left, wing. The longest black line, i.e. from the costa at about 10 mm. before the apex, varies in much the same way as it does in the normal form, i.e. it may be straight and continuous almost to the tornus, or it may be interrupted on nervure 4, or even interrupted on all the nervures in a step-like manner. The subapical black line, usually not reaching beyond nervure 5, is usually clear and single, but sometimes doubled, sometimes fragmentary. These three lines also vary asymmetrically. The submarginal area is pure pale grey and contrasts with the fuscous-suffused area before the longest cross-line; it contains a few short black lines on the costa and only occasional traces near the middle of the outer border of the very fine wavy lines typical of normal *cossus* forms. Fringe: chequered or uniform.

Hindwing, pale grey basad near the costa, otherwise heavily suffused with fuscous and variable in the extent and course of the wavy blackish lines. Fringes, either white interrupted with fuscous at the nervures, or more uniformly fuscous.

Underside forewing: like upperside but more infuscate and with lines less distinct; hindwing like upperside, but less infuscate, and with lines more distinct.

Span: 58–68 mm. (♂♂ only).

Holotype: 1 ♂, IRAQ, Shaqlawa, 2500 ft., leg. M. Kossa, 3.vii.53 (in coll. m.).

Paratypes: 6 ♂, same place, 23.v–5.vii.53 and 22.v.54. (in coll. m. and coll. Daniel).

Dedicated to Mr. Michael Kossa of Shaqlawa to whom I am indebted for the capture of many interesting Kurdish lepidoptera.

* 892. **Dysspessacossus fereidun** Gr.-Gsh. (Pl. V, Figs. 6, 11).

This moth flies together with the preceding in its Iraqi mountain habitats and also appears in two races, very distinct in appearance, characteristic respectively of Upper and Middle Heights.

Its biology is doubtless similar but it is an Anatolian-Iranian species.

At Upper Heights the pure white typical form (Pl. V, Fig. 11) flies, but at Middle Heights a grey form (Pl. V, Fig. 6) occurs, which is described briefly hereunder and named in honour of Dr. Dhia Ahmad, the Iraqi entomologist.

Dyspessacossus fereidun Gr.-Gsh. **ahmadi** subsp. n. (Fig. 6).

The grey ground-colour of both forewing and hindwing distinguish this race from the typical. The similarly coloured *Dyspessacossus hadjinensis* Dan., from Turkey, has differently formed wings and antennae and seems to be a distinct species.

Holotype and paratypes: 4 ex., IRAQ, Shaqlawa (c. 2500 ft.), 23.v-4.vi.53 (in coll. m. and coll. Daniel).

* **893. Zeuzera regina** Stgr. (Pl. V, Fig. 10).

Inhabits the woodland zone of the mountains but probably also will be found in oases of the Upper Heights where willows and fruit trees grow.

On the analogy of its congeners, the larva may be presumed to bore in the wood of various trees and to be a potential pest to useful trees. Univoltine, flying in June-July.

Anatolian-Iranian.

** **894. Zeuzera pyrina** L.

Inhabits the woodland zone of the mountains.

The larva bores inside the branches and trunks of many trees. In some places it is a well-known destructive pest to fruit-trees, but this has not yet been reported as happening in Iraq. Univoltine, flying in June.

Holarctic.

895. Holcocerus gloriosus Ersch. subsp. **mesopotamicus** Watk. and subsp. **laudabilis** Stgr. (Pl. II, Figs. 9, 10).

This moth inhabits the deserts of Iraq, the form *mesopotamicus* (Pl. II, Fig. 9) being known from Kut, Amarah, and the desert west of Kerbela, and the form *laudabilis* (Pl. II, Fig. 10) being known from the deserts of the extreme south, west of Basra.

Univoltine (?), flying from May to August. Presumably the larva of this and of other desert Cossids feed on the roots of desert plants.

An Anatolian-Iranian moth with Pan-Eremic range, from Central Asia to N. Africa. The form *mesopotamicus* is also found in South Persia, the form *laudabilis* in Ahwaz (S. Persia), Arabia and Palestine.

896. Hypopta lignosus Brandt.

This moth, described from Fars, S.W. Persia, in Brandt (1937) has recently been taken at Upper Heights in the Kurdish mountains of Iraq.

Univoltine, flying in July-August in Iraq.

Anatolian-Iranian.

897. Stygia saharae Luc.

Inhabits the deserts of N. Iraq, and perhaps is very widespread south-eastwards.

Univoltine, flying in July-August.

Anatolian-Iranian, with Saharan-Sindian range, here at its most easterly and northerly known limit.

898. *Phragmacossia tigrisia* Schaw.

The exact habitat of this moth is not recorded; the original type was taken in the Mosul district, and it has not been recaptured. Its facies suggests that it is a desert moth.

An apparently endemic Anatolian-Iranian species.

899. *Dyspessa ulula* Borkh.

Widespread in the mountains, mostly in the form *pallidata* Stgr.

Bivoltine, flying in June–July and September.

Anatolian-Iranian, with Euroriental range.

900. *Dyspessa hethitica* Dan.

Inhabits the mountains of N. Iraq.

Univoltine, flying in May at Middle Heights.

Anatolian-Iranian.

901. *Dyspessa asema* Püng. (det. LeCerf).

Inhabits the deserts of Iraq from those west of Kerbela southwards into Arabia.

Univoltine, flying in Early May.

Examples from the Tejen oasis in Transcaspia in the British Museum, labelled *asema*, do not quite agree with this form from Iraq and Arabia which LeCerf considered to be *asema*. Until the identity of both is cleared up one can only say that the Iraqi moth is an Anatolian-Iranian Eremic insect.

902. *Dyspessa wiltshirei* Dan.

Inhabits the desert foot-hills of the Dyala region and extends into the Middle Heights of the mountains, where the form is less pale and rosy and somewhat larger. Not enough have been taken at Middle Heights to justify naming the race as distinct. The foot-hill form was described in Daniel (1938).

Univoltine, flying in late February or March in the foot-hill region, and April–May at Shaqlawa.

An apparently endemic Anatolian-Iranian moth.

903. *Dyspessa bipunctata* Stgr. subsp. *marginepunctata* Wilts.

Originally described in Wiltshire (1939, iii) and illustrated in Wiltshire (1946, i), this form inhabits the mountains of N. Iraq. It may also inhabit oases of the foot-hill zone.

Univoltine, flying in June–July at Upper Heights; at Ahwaz, S.W. Iran, it has been taken in April.

Anatolian-Iranian.

904. *Phragmataecia territa* Stgr.

Inhabits Upper and Middle Heights of the mountains.

Univoltine, flying in August–September. Since some of its habitats are dry mountain sites, the probable foodplant is grass-roots and not the same as the more widespread following species.

An Anatolian-Iranian mountain-species.

905. *Phragmataecia castaneae* Hübn.

THE REED-LEOPARD MOTH.

Inhabits the marshes near Amarah and probably reedy places elsewhere in Iraq.

Bivoltine, flying in early summer and early autumn. The larva feeds internally in reed-stems (*Phragmites*).

Very wide-spread (Palaeo-tropical and Palaearctic).

Sub-order: MONOTRYZIA

Super-family: INCURVATIOIDEA

Family: ADELIDAE.

906. *Nemotois antilyca* Meyr. (Pl. XV, Fig. 75).

Described in Meyrick (1936), this moth is only known from the Diana plain at Middle Heights of the mountains, where it comes to light freely in April-May. It is probably more widespread in similar places.

Super-families: NEPTICULOIDEA, HEPIALOIDEA

There are no records of these from Iraq.

Sub-order: DACNONYPHA

Family: ERIOCRANIIDAE

Of these, too, there is no Iraqi record.

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<i>brandti</i> , <i>Rethera</i>	153a	<i>cinxia</i> , <i>Melitaea</i>	77
** <i>brassicae</i> , <i>Pieris</i>	11	<i>circe</i> , <i>Kanetisa</i>	96
<i>brevifurca</i> , <i>Lithosia</i>	170	<i>circumdatella</i> , <i>Myelois</i>	675
<i>briseis</i> , <i>Chazara</i>	101	<i>circumflexa</i> , <i>Syngrapha</i>	427
<i>bruguieralis</i> , <i>Parastenia</i>	747	<i>clarissa</i> , <i>Abrostola</i>	432
<i>brunnealis</i> , <i>Actenia</i>	692	<i>clavaria</i> , <i>Larentia</i>	534
<i>brunneata</i> , <i>Eupithecia</i>	556	<i>clavipalpis</i> , <i>Caradrina</i>	371
<i>bucephaloides</i> , <i>Phalera</i>	196	<i>coerulea</i> , <i>Eugnorisma</i>	237
<i>buxtoni</i> , <i>Catamecia</i> ,	314	<i>cohaesa</i> , <i>Amathes</i>	249
<i>buxtoni</i> , <i>Cephis</i> (<i>Archigalleria</i>)	735	<i>colchicalis</i> , <i>Constantia</i>	714
<i>buxtoni</i> , <i>Eurhodope</i>	678	<i>colchidaria</i> , <i>Gnopharmia</i>	570
<i>buxtoni</i> , <i>Heterographis</i>	681	<i>collina</i> , <i>Melitaea</i>	78
<i>buxtoni</i> , <i>Lithostege</i>	530	<i>combota</i> , <i>Limnoecia</i>	810
		<i>comes</i> , <i>Triphaena</i>	246a
		<i>comma</i> , <i>Hesperia</i>	128
<i>caesialis</i> , <i>Evergestis</i>	769	<i>compta</i> , <i>Hadena</i>	260
<i>cailino</i> , <i>Syneda</i>	457	<i>concatenalis</i> , <i>Dattinia</i>	709
<i>c-album</i> , <i>Polygonia</i>	76	<i>concevella</i> , <i>Heterographis</i>	608
* <i>calidella</i> , <i>Ephestia</i>	597	<i>confinalis</i> , <i>Pionea</i>	779
<i>callidice</i> , <i>Synchlloe</i>	15	<i>conflua</i> , <i>Acrocercops</i>	874
<i>callimachus</i> , <i>Tomares</i>	33	<i>confusa</i> , <i>Autographa</i> (<i>Plusia</i>)	429
<i>calvaria</i> , <i>Epizeuxis</i>	473	<i>confusa</i> , <i>Oncocnemis</i>	296
<i>cambysea</i> , <i>Anthrocera</i> (<i>Zygaena</i>)	489	<i>confusella</i> , <i>Ethmia</i>	813
<i>camparia</i> , <i>Sterria</i>	511	<i>congrua</i> , <i>Mythimna</i>	272
<i>canariensis</i> , <i>Euxoa</i>	204	<i>conjuncta</i> , <i>Paidia</i>	172
<i>candidana</i> , <i>Porphyria</i>	402	<i>consecratalis</i> , <i>Cledeobia</i>	689
<i>candidatella</i> , <i>Heterographis</i>	612	<i>consona</i> , <i>Plusia</i>	431a
<i>canescens</i> , <i>Antitype</i>	312	<i>conspicillaris</i> , <i>Xylomiges</i>	264
<i>canifusalis</i> , <i>Dattinia</i>	708	<i>conspicua</i> , <i>Euxoa</i>	199
<i>caradjae</i> , <i>Ethmia</i>	811a	<i>contaminellus</i> , <i>Crambus</i>	717
<i>cardamines</i> , <i>Anthocharis</i>	20	<i>convexella</i> , <i>Heterographis</i>	609
<i>carducha</i> , <i>Antitype</i>	313	* <i>convolvuli</i> , <i>Herse</i>	148
<i>carducha</i> , <i>Bryomima</i>	300	<i>cordiaria</i> , <i>Eilicrinia</i>	565
* <i>cardui</i> , <i>Vanessa</i>	71	<i>coremetella</i> , <i>Salebria</i>	658
<i>carmon</i> , <i>Polyommatus</i>	63a	<i>corsica</i> , <i>Mamestra</i>	255
<i>casta</i> , <i>Calophasia</i>	285a	<i>cossus</i> , <i>Cossus</i>	891
<i>casta</i> , <i>Melitaea</i>	81	<i>costalbella</i> , <i>Homoeosoma</i>	599
<i>castaneae</i> , <i>Phragmataecia</i>	905	<i>costalis</i> , <i>Hypsopygia</i>	703
<i>castiliella</i> , <i>Metzneria</i>	805	<i>costobscurella</i> , <i>Symmoca</i>	835
<i>castrensis</i> , <i>Malacosoma</i>	140a	<i>craccae</i> , <i>Lygephila</i>	461
* <i>catalaunalis</i> , <i>Antigastra</i>	763	<i>crassa</i> , <i>Agrotis</i>	216
** <i>cautella</i> , <i>Ephestia</i>	594	* <i>crataegi</i> , <i>Aporia</i>	7
<i>celerio</i> , <i>Hippotion</i>	160	<i>crepusculella</i> , <i>Adelosemia</i>	673
<i>celsicola</i> , <i>Ochropleura</i>	232	** <i>cretica</i> , <i>Sesamia</i>	384
<i>celtis</i> , <i>Libythea</i>	67	<i>cribrella</i> , <i>Myelois</i>	676
<i>cerealis</i> , <i>Autophila</i>	332	<i>croceago</i> , <i>Xanthia</i>	315
<i>cerinaula</i> , <i>Coleophora</i>	840	* <i>croceus</i> , <i>Colias</i>	25
<i>cerisyi</i> , <i>Zerynthia</i>	4	<i>crocotoxa</i> , <i>Trissonca</i>	618
<i>cespitalis</i> , <i>Pyrausta</i>	788	<i>cruda</i> , <i>Orthosia</i>	265
<i>chabordis</i> , <i>Cleophana</i>	290	<i>cruentalis</i> , <i>Phlyctaenodes</i>	774
* <i>chalcites</i> , <i>Plusia</i>	431	<i>cuvieri</i> , <i>Anthrocera</i>	488a
<i>charlonia</i> , <i>Anthocharis</i>	22	<i>cyaxares</i> , <i>Lithophasia</i>	297a
<i>chenopodiphaga</i> , <i>Pseudohadena</i>	347	<i>cyllarus</i> , <i>Glaucopsyche</i>	48
<i>chionella</i> , <i>Phalonia</i>	867	<i>cymaenotaenia</i> , <i>Autophila</i>	334

	NO.		NO.
cyrenaicellus, Crambus	718	eustatica, Nephopteryx	651
dahliella, Psorosa	631	evergestalis, Trigonuncus	772
dalmatinella, Agriphila	720a	eversmanni, Lasiocampa	141
damone, Euchloe	21	*exclamationis, Agrotis	212
damone, Polyommatus	63	**exigua, Laphygma	365
daphnis, Meleageria	66	exsculpta, Aglossa	697
daplidice, Pontia	12	exsiccata, Tathorrhynchus	329
davidi, Akbesia	154	exsoleta, Xylena	307
debskii, Dattinia	711	extensalis, Hypena	479
deceptrix, Ecbolema	348	externata, Oulobophora	538
degeneraria, Sterrha	512	extremata, Eupithecia	550
(delattini, Arenostola	381)		
delicata, Metopoceras	296	farinalis, Pyralis	701
dentinosa, Simyra	318	farinosa, Gonepteryx	27
*dentula, Arcyophora	425	*fascialis, Hymenia	742
desertalis, Evergestis	770	fasciana, Chondrostega	137
desertellus, Crambus	719	fatua, Hipparchia	94
designella, Anephtopteryx	652	fausta, Colotis	24
destituta, Lymantria	183	favonius, Satyrus	97
diacona, Myrmecozela	880	feisali, Chondrostega	137
diamondi, Metzneria	806	*feraidun, Dyspessacossus	892
diaphana, Phycita	643	ferrago, Mythimna	269
diaphora, Thalerastria	411	ferrugalis, Pionea	778
didyma, Melitaea	82	filicata, Sterrha	505
dionysia, Oligochroa	656	fimbriola, Chersotis	245
diplocapna, Arimania	647	fissipuncta, Sidemia	341
dipotamica, Sumeria	198	fiabellaria, Zamacra	574
dipsacea, Heliothis	392	flaccidaria, Scopula	516
discella, Epidauria	682	flammatra, Ochropleura	235
discomaculella, Candiope	635	flammealis, Endotricha	715
**dispar, Lymantria	182	flava, Caradrina	372
disparalis, Aeschremon	797	flavina, Ochropleura	228
disputaria, Tephрина	589	flexuosa, Syneda	456
dissocyma, Lithostege	531	floccifera, Carcharodus	118
diversa, Ephesia	441	floralis, Noctuelia	793
diversa, Luperina	343	florella, Catopsilia	28
divisa, Cryphia	323	fluctuata, Cidaria	541
divisella, Nephopteryx	649	forficula, Ochropleura	226
dorilis, Lycaena	38	formosella, Euzophera	639
doryceraeformis, Chamaesphacia	878	fovealis, Duponchelia	746
**dowsoniella, Ephestia	595	foviferalis, Phlyctaenodes	776
dulcella, Rhodophaea	669	fraxineti, Ennomos	562
dumerilii, Luperina	342	frustata, Cidaria	546
duponcheli, Leptidea	6a	fulgurita, Hypeuthina	357
dysodea, Mamestra	256	fuliginosa, Phragmatobia	179
		fulvobasella, Heterographis	613
egea, Polygonia	75	funesta, Aedia	464
egeria, Pararge	105	furia, Thyridophora	737
elbursica, Ortholitha	534a	*fuscipunctella, Tinaea	884
*elocata, Catocala	435		
elongaria, Sterrha	507	gafsana, Copiphana	286
**elutella, Ephestia	596	galba, Chilades	46
emiralis, Loxostege	768	*gamma, Autographa (Plusia)	430
endoperona, Aretascetis	838	geminipuncta, Archanara	383
engys, Hemerophila	577	generosella, Pleurota	830
eo, Emprepes (Neoschoenobia)	799	geometrica, Parallelia	448
epargyros, Apharitis	35	ghirshmani, Epitherina	560
erema, Gnopharmia	569	gigantea, Cynaeda	801
eremica, Phycita	644	gigantellus, Schoenobius	731
eremicola, Cornigerula	605	gilvella, Anoristia,	622
ergane, Pieris	8	gina, Melitaea	83
ernesti, Metopodicha	301	glaucata, Cilix	146
esmodes, Eucosma	865	glauconome, Pontia	13
cucharista, Cryphia	326	glebifera, Polychrosis	862
eupheme, Zegrus	23	gloriosa, Metalopha	293
euphorbiae, Celerio	157	gloriosus, Holcocerus	895
euphraticana, Gypsonoma	871	gorgon, Sphingonaipiopsis	155
eurypilus, Plebejus	53	gracilis, Ochropleura	232

	NO.		NO.
<i>gracilis</i> , Salebria	657	<i>irakella</i> , Bagdadia	807
<i>graeca</i> , Procris	488	<i>irakensis</i> , Gnopharmia	571
* <i>graellsii</i> , Xanthodes	426	<i>iranalis</i> , Dattinia	707
<i>grandis</i> , Lasiocampa	143	<i>iranica</i> , Cryphia	326
<i>gratiosata</i> , Eupithecia	549	<i>irritaria</i> , Eupithecia	551
<i>grisescens</i> , Maraschia	344	<i>isatidalis</i> , Evergestis	771
<i>gruneri</i> , Anthocharis	19	<i>ischnodactyla</i> , Alucita	847
<i>gueneei</i> , Hadenia	257c	<i>islamella</i> , Eromene	722
<i>gutturalis</i> , Pyrausta	790	<i>isoxyla</i> , Oligochroa	656
<i>gypsocrates</i> , Praeepischnia	671	<i>isthmicalis</i> , Cledeobia	690
<i>hadjina</i> , Ochropleura	226	<i>johanna</i> , Apatele	320
<i>haemopsamma</i> , Oeobia	784	<i>johanna</i> , Eumichtis	314
<i>haifae</i> , Agrotis	214	<i>jubata</i> , Cleophana	289
<i>hamza</i> , Thymelicus	126	<i>jurtina</i> , Epinephele	108
<i>haplogramma</i> , Cybolomia	760	<i>kalchbergi</i> , Hypenodes	482
<i>harmonielli</i> , Heterographis	610	<i>kalifella</i> , Symmoca	833
<i>harouni</i> , Celama	165	<i>kerbelella</i> , Ancyloides	601
<i>hebe</i> , Arctia	178	<i>kerbelella</i> , Hapsifera	887
<i>hecate</i> , Brenthis	89	<i>kerbelella</i> , Pleurota	829
<i>hederalis</i> , Chiloides	735	<i>kindermanni</i> , Smerinthus	149
<i>hellenica</i> , Heterographis	607	<i>knysna</i> , Zizeeria	47
<i>hethitica</i> , Dyspepsa	900	<i>koeppeni</i> , Eicomorpha	247a
<i>herbaria</i> , Microloxia	503	<i>komaroffi</i> , Arimania	647
<i>herrichii</i> , Mythimna	275	<i>komarovi</i> , Rethera	153b
<i>herzogi</i> , Agrotis	213	<i>korbi</i> , Chesias	537
<i>hieroglyphella</i> , Lasiosticha	632	<i>korbi</i> , Notodonta	195
<i>hilaris</i> , Euxoa	206	<i>korbi</i> , Polyploca	492
<i>hoferi</i> , Eumera	563	<i>korvaci</i> , Eupithecia	555
<i>honestalis</i> , Actenia	691	<i>kotschy</i> , Berutana	153
* <i>hornigii</i> , Spermatophora	598	<i>kurdistana</i> , Cnephasiella	857
<i>hueberi</i> , Armada	470	<i>lacernaria</i> , Glaphyra	398
<i>hyalina</i> , Dysauxes	164	<i>lactiflora</i> , Euzophera	642
<i>hypoanides</i> , Stilbina	356	<i>lactifica</i> , Nephopteryx	650
<i>hyperici</i> , Actinotia	355	<i>laetus</i> , Oxyptilus	845
<i>ianthina</i> , Triphaena	247	<i>lahayei</i> , Pingasa	498
<i>icarus</i> , Polyommatus	55	<i>l-album</i> , Mythimna	271
<i>idalia</i> , Pleurota	832	<i>lamprostoma</i> , Onebala	826
<i>ilicis</i> , Thecla	30	<i>lanceolana</i> , Bactra	863
<i>illustris</i> , Sterrha	509	<i>languida</i> , Mythimna	277
<i>immistaria</i> , Scopula	519	<i>languidalis</i> , Pionea	777
<i>impar</i> , Oxypteron	855	<i>lapidicola</i> , Lymantria	184
<i>imperialis</i> , Pyralis	702	<i>larissa</i> , Melanargia	91
<i>incarnata</i> , Rhodocleptria	316	<i>lasserrei</i> , Agrotis	218
<i>incerta</i> , Orthosia	266	** <i>latebrosa</i> , Spodoptera	362
<i>incertellus</i> , Schoenobius	733	<i>lathonia</i> , Issoria	85
<i>inclusa</i> , Euxoa	205	<i>lathyri</i> , Leptidea	6a
<i>incoloralis</i> , Pyrausta	783	<i>laudeti</i> , Euterpia	262a
<i>indecurella</i> , Cerostoma	851	<i>ledereri</i> , Lithophane	306
<i>indicatalis</i> , Hypena	478	<i>ledereri</i> , Derthisa	301
<i>ingenua</i> , Aporophyla	303	<i>lepida</i> , Hadenia	257a
<i>ingrata</i> , Caradrina	319	<i>lepidalis</i> , Tegostoma	745
<i>inquinata</i> , Plecoptera	460	<i>lepidella</i> , Ethmia	815
<i>insignata</i> , Eugnorisma	238	<i>lepidella</i> , Salebria	659
<i>insoluta</i> , Archanara	382a	* <i>lesbia</i> , Catocala	438
** <i>insulana</i> , Earias	421	<i>leucocrossa</i> , Marasmarcha	846
<i>insularis</i> , Zethes	474	<i>leucosarca</i> , Ciliocera	680
<i>intermedia</i> , Cerura	192	<i>libatrix</i> , Scoliopteryx	458
<i>interpunctaria</i> , Myinodes	496	* <i>licarsisalis</i> , Pachyzancla	751
<i>interrupta</i> , Harpyia	191	<i>ligaminosa</i> , Autophila	333
<i>intervacatalis</i> , Parastenia	748	<i>lignosus</i> , Hypopta	896
<i>ionia</i> , Thaleropsis	69	<i>limata</i> , Armada	471a
<i>iozona</i> , Ichorarchia	646	<i>limbata</i> , Autophila	331
<i>iphigenia</i> , Polyommatus	58	<i>limbopunctalis</i> , Pyrausta	782
** <i>ipsilon</i> , Agrotis	211	<i>lineata</i> , Celerio	159
<i>irakana</i> , Earias	422	<i>lineola</i> , Thymelicus	125
<i>irakella</i> , Ancyloleomia	728		

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literosa, Procus	341	mithridates, Polyommatus	57
**litura, Prodenia	363	mnemosyne, Parnassius	6
litrata, Metalopha	294	modesta, Dasycorsa	564
liturosella, Epilydia	638	moconis, Cryphia	325
livornica, Celerio	159	moldavica, Ozarba	409
loewii, Ocnogyna	175	monodactyla, Emmelina	843
loewii, Polyommatus	59	monostictella, Heterographis	614
lophotalis, Macalla	600	monoglypha, Apamea	338
*loreyi, Mythimna	278	monogrammos, Eurhodope	667
lucida, Tarache	415	monotona, Kerbela	800
lucipeta, Rhyacia	242	monotona, Shirazia	684
luctuosa, Tarache	416	mossulalis, Tegostoma	794
ludificata, Cidaria	543	muliebris, Trissonca	615
*lupina, Catocala	439	murina, Amicta	852
lupinus, Hyponephele	111	muscosa, Leucochlaena	302
luteago, Hadena	257b	muscula, Lithosia	170
(luteella, Diatraea	734)	musculata, Anaitis	536
luteocincta, Hadena	258	*musculosa, Oria	385
lutosa, Hadjina	359	napi, Pieris	10
lutulentalis, Pyrausta	789	nemorana, Simaethis	840
lutumella, Klimeschia	889	neonympha, Mormonia	434
lycaon, Hyponephele	112	*nerii, Daphnis	152
lychnitis, Cucullia	283	*ni, Trichoplusia	428
lychnitis, Scythris	804	nicaea, Celerio	158
lydella, Praeepischnia	671	nigrescens, Ochropleura	229
lythargyria, Mythimna	269	nigricans, Euxoa	201
		nigrigranella, Pristophora	627
*machaon, Papilio	1	niobe, Fabriciana	88
machimopis, Ensepestra	841	noctuella, Nomophila	750
macrocyrtensis, Nephopteryx	648	nostrodamus, Gegenes	131
**maculipennis, Plutella	850	notata, Lithostege	532
maculivittella, Saluria	602	nubigera, Heliothis	395
magnetella, Gelechia	824	nubila, Aegle	384
manlia, Anthrocera (Zygaena)	490	nucleolella, Psorosa	630
marcidus, Nordmannia	32	**nudalis, Loxostege	767
margaritella, Myelois	679	nyctimerides, Rhyacia	243
marginalis, Bostra	696	nymphaea, Ephesia	442
marginepunctata, Scopula	515	obesa, Agrotis	217
marloyi, Erynnis	116	objectaria, Gnopharmia	568
masuralis, Hypena	478	oblitella, Trissonca	616
maura, Axiopaena	177	obolucha, Depressaria	816
maura, Mormo	336	obsitaria, Anaitis	534b
maxima, Apharitis	34	obstipata, Cidaria	540
mediterraneae, Tarucus	43	ocellea, Eromene	721
megapterella, Plutella	849	ochracea, Paraegle	391
megea, Pararge	106	ochrearia, Aspilates	593
melania, Porthesia	188	ochreella, Aphyteles	633
melanochroa, Hadena	259	ochrifascialis, Metasia	757
melanotaenia, Gnopharmia	567	ochroleucata, Scopula	518
melanura, Ochropleura	224	octogenalis, Epactotena	754
meleager, Meleageria	66	ocularis, Palimpsestis	492
meleodes, Monopis	881	oleagina, Synvaleria	310
mellonella, Galleria	686	oleracea, Mamestra	254
menava, Pararge	107	olivaria, Ennomos	561
mendicalis, Metasia	756	omar, Metopoceras	295
mercatrix, Pistogenes	641	ononaria, Aplasta	495
*meridionalis, Pyrausta	787	onustarius, Gnophos	586
mesentina, Belenois	14	oo, Dicycla	350
mesopotamica, Atychia	875	obesalis, Hypena	480
mesopotamica, Dattinia	706	obsitalis, Hypena	479
mesopotamica, Depressaria	816	**obsoleta, Heliothis	394
mesopotamica, Mormonia	433	obsoletalis, Therapne	700
metaxys, Allophyes	309	obsoletaria, Sterrha	508
meticulosa, Phlogophora	354	opposita, Cleophana	287
milhauseri, Hoplitis	193	*optima, Catocala	437
mimetes, Bapta	558	orbata, Dysgonia	447
minima, Catamecia	348a	orbifer, Spialia	120
minimalis, Bostra	694		

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orithya, Junonia	70	polemia, Microloxia	502
ornata, Scopula	513	poliopastalis, Dattinia	705
ornatalis, Ercta	745	politata, Sterrha	510
ossealis, Metasia	758	pollinarius, Gnophos	588
osmanica, Dyscia	591	polycapna, Trissonca	619
ostentella, Telphusa	825	polychloros, Polygonia	74
osthelderi, Spialia	119	polygonalis, Mecyna	749
ostrina, Porphyrinia	399	polygramma, Porphyrinia	403
ottoella, Myelois	675	polygrammata, Cidaria	548
ottoi, Aegle	389	pontica, Craniophora,	321
otus, Pachypasa	144	pontica, Eugnorisma	241
oxycyma, Taftania	629	pontica, Pyrausta	785
		*populi, Laothoe	151
palaestinensis, Amathes	250	postalbidior, Laodamia	621
palaestinensis, Lithostege	533	praepetalis, Pyrausta	784
palaestinensis, Sterrha	504	pronuba, Triphaena	246
palariformis, Dipsosophecia	877	protea, Dryobotodes	311
pallens, Irakia	665	proteroleuca, Ptyonocera	645
pallida, Metaegle	388	proto, Muschampia	122
palpella, Ancyolomia	727	proxima, Chilena	140
paludellus, Crambus	716	proxima, Herminia	475
palumba, Gnophosema	497	pseudodiscomaculella, Candiope	636
palumbella, Salebria	663	pseudolydella, Epiepischnia	670
pampaninii, Calophasia	262	psologramma, Leptarchis	748
pamphilus, Coenonympha	113	*puerpera, Catocala	436
panaceorum, Armada	469	pulchella, Euzophera	640
panagea, Turanana	51	pulchella, Krombia	699
pandora, Damora	86	pulchella, Utetheisa	173
paphia, Argynnis	87	pulcherrima, Harpyia (Cerura)	190
parallela, Porphyrinia	404	pulmentaria, Chlorissa	499
parisatis, Hipparchia	95	pulveralis, Psammotis	764
parva, Porphyrinia	400	pulverata, Hadula	253
parvaspersa, Caradrina	316	pulverea, Amathes	249
pauli, Chondrostega	136	pulvereisparsa, Neromia	501
pectinatella, Tollia	729	pulverosa, Eromene	724
pectinicornis, Cleophana	288	pulverosa, Saluria	603
peilei, Lemonia	135	pumicosa, Myelois	674
pellucida, Hipparchia	93	pumilata, Gymnoscelis	557
pelopea, Pseudochazara	99	pumilio, Gegendes	130
**peltigera, Heliothis	393	punctella, Ematheudes	683
pentadalis, Cybolomia	762	punctosa, Mythimna	274
perfervidalis, Pionea	780	purpuraria, Lythria	529
persca, Melitaea	84	purulentella, Apiletria	838
persephone, Chazara	102	pusiella, Ethmia	811
pertusalis, Tretopteryx	688	pustulalis, Phlyctaenodes	773
perviaria, Tephрина	590	puta, Agrotis	215
philippsi, Eriogaster	139	pylaon, Plebejus	52
*philocarpa, Pyroderces	809	pyramidea, Amphipyra	335
phlebophora, Aedophron	397	*pyri, Saturnia	134
phlaeas, Lycaena	41	pyrina, Zeuzera	894
phoebe, Melitaea	80	quadrinotella, Ethmia	814
phragmitidis, Arenostola	381	quadripuneta, Oegoconia	836
phthoneropsis, Cirrochrista	755	quadripunetaria, Euplagia	180
phycophanes, Scoparia	738	quadriregula, Lithophasia	297
phyllis, Polyommatus	64	quercella, Talis	726
placida, Anthrocera (Zygaena)	491	quercetica, Eupithecia	553
placida, Phragmatobia	179a	quercus, Marumba	150
plutelliformis, Gelechia	823	quercus, Zephyrus	29
pierreti, Agrotis	219		
pigra, Pygaera	197	rafidain, Eugnorisma	240
pillariana, Sparganothis	869	**rapae, Pieris	9
pimpla, Satyrus	98	raptricula, Cryphia	323
*pimplaeformis, Eusphesia	876	ravalis, Rhynchodontodes	476
*pinguinalis, Aglossa	698	rayatella, Eromene	725
piroformis, Scoparia	740	rayatica, Nychiodes	576
platyphaea, Loxostege	775	rebeli, Aegle	390
plebejaria, Dyscia	592	rectilinea, Cryphia	324
*podalirius, Iphiclides	3	recurvalis, Hymenia	742

	NO.		NO.
reflexa, Plecoptera	459	solidaria, Chlorissa	500
*regina, Zeuzera	893	*solitaria, Thaumetopoea	189
regularis, Acantholipes	466	solskyi, Pristocera	626
renalis, Allophytes	306	sordida, Oligochroa	655
(revayana, Sarrothripus	419)	sparsella, Symmoca	834
revolutalis, Rhynchodontodes	477	spectabilis, Volgarctia	177
rhectogramma, Aproceratia	666	spectrum, Apopestes	328
rhenella, Nephopteryx	650	spilota, Anumeta	468
rhodocharis, Mamestra	257	spinifera, Agrotis	208
rhodochrella, Heterographis	606	splendidalis, Euclasta	744
rhomboidaria, Boarmia	578	squalens, Pericyma	454
ripartii, Polyommatus	62	squalidior, Ochropleura	222
rivularis, Limenitis	68	squalorum, Ochropleura	221
robiginosa, Euxoa	202	squamodorella, Pseudoteleia	827
roederi, Bryophilopsis	420	stachypora, Gnophos	578
rogenhoferi, Parallelia	450	staudingeri, Calamia	352
romanoffella, Salebria	662	staudingeri, Chionoxantha	409
rorida, Orthosia	267	stellatarum, Macroglossa	156
rosacea, Tarucus	43	stenopterella, Tephros	653
rosana, Cacoecia	858	stenopterellus, Crambus	720
roxelana, Pararge	103	steveneria, Neognopharmia	572
rufaria, Sterrha	504	stichograpta, Cronodoxa	880
ruficiliaria, Cosymbia	526	stigmatula, Ochropleura	233
*rumicis, Apatele	319	stolida, Parallelia	449
rupestris, Scoparia	739	straminea, Euxanthus	868
rupicapralis, Prochoristis	752	straminea, Porphyrinia	407
russulalis, Emprepes	798	strigicosta, Cucullia	284
ruticola, Schistodepressaria	818	strigula, Celama	167
		*styx, Acherontia	147
saadi, Coenonympha	114	subcandidatella, Heterographis	611
**sabella, Arenipises	685	subchlamydule, Nola	168
sabulosa, Anumeta	467	subcribrella, Euzophera	641
sacraria, Rhodometra	527	submutata, Scopula	514
saharae, Stygia	897	subsericata, Polyphaenis	337
salicata, Cidaria	542	subsolanica, Procris	486
salzi, Caradrina	374	subtilis, Rhabinopteryx	358
sancta, Stiphrometasia	753	suellus, Pergesa	159a
sandosaria, Cidaria	547	suleimania, Apocheima	573
scabra, Agrochola	317	suppandalis, Metasia	759
scalaris, Loxostege	766	*suppressalis, Chilo	736
schah, Euloastra	410	suppuncta, Porphyrinia	406
schawerdae, Evisa	304	surchica, Caradrina	367
scurrilis, Euxoa	203	synclina, Myelois	677
secalis, Apamea	340	syriaca, Clytie	451
**segetum, Agrotis	209	syriaca, Hipparchia	92
semibrunnea, Lithophane	305	syriacalis, Rhynchodontodes	477
semiramis, Eugnorisma	239	syriacaria, Semiothisa	567
semiramis, Lacydes	177a		
semirubella, Salebria	661	tabidaria, Rhodostrophia	525
semitata, Glossotrophia	520	tabora, Cryphia	327
semna, Chersotis	244	tacapealis, Bostra	695
sericealis, Rivula	472	tages, Erynnis	115
serraticornella, Melanastia	634	tamara, Anthrocera (Zygaena)	491
serratulae, Pyrgus	124	tamaricis, Agdistis	842
sertorius, Spialia	120	taochata, Triphosa	539
shahkuhensis, Amictoides	854	tarda, Tamsola	485
shaqlawana, Tortricomorpha	861	taurica, Parexarnis	236
siceliota, Buckleria	848	taylori, Discestra	251
sieversii, Rhodostrophia	524	telmessia, Epinephele	109
signatoria, Ocnaria	186	temera, Euxoa	200
signifera, Ochropleura	234	**temperatella, Syringopais	802
silenides, Pronotestra	263	tengistana, Megalodes	387
simplicialis, Dattinia	665	tentaculella, Ancyloleomia	728
sinaica, Dattinia	711	tenuisaria, Jordanisca	580
singularis, Ochropleura	225	terebynthina, Ocnaria	185
sinuosalis, Phlyctaenodes	775	terminicincta, Ochropleura	223
*siva, Nadiasa	145	terreni, Lasiocampa	142
snelleni, Gnophos	579	terrenus, Pterophorus	844

	NO.		NO.
terrata, Phragmataecia	904	variegatus, Gnophos	587
terrulenta, Clytie	452	vassilini, Haemerosia	380
tessellum, Muschampia	121	venata, Ochlodes	129
textaria, Sterrha	506	venosana, Bactra	864
thelephassa, Chazara	100	verbascalis, Pyrausta	791
theresia, Epicimelia	493a	verbascella, Nothris	819
thersamon, Lycaena	40	verbasci, Cucullia	285
thetis, Lycaena	37	veronicae, Conistra	316
*thrax, Pelopidas	132	versicolor, Margelana	213
tigrisia, Phragmacossia	898	vetusta, Cortyta	455
*tirhaca, Anua	444	villosa, Amictoides	853
tityrus, Lycaena	38	vinula, Cerura	192
togatulalis, Roeselia	169	virginalis, Metasia	755
torrida, Dysgonia (Parallelia)	446	virginalis, Pyrausta	786
trabealis, Emmelia	412	viridana, Tortrix	859
traducalis, Synclera	743	viriplaca, Heliiothis	392
tricentra, Laspeyresia	866	viscosa, Hadjina	360
trifolii, Discestra	251	vitellina, Mythimna	270
trinalis, Pyrausta	785	vitellinella, Ematheudes	683
triplacogramma, Cybolomia	761	vulgaria, Euchloris	503a
tristis, Bostra	693		
triura, Melitaca	81	wagneri, Epinephele	110
trochylus, Freyeria	45	wanensis, Gnophos	581
trux, Agrotis	210	wiltshirei, Caradrina	368
turanica, Celama	166	wiltshirei, Constantia	712
turatii, Caradrina	373	wiltshirei, Dyspessa	902
turbida, Harpyia	191	wiltshirei, Gnophos	588
turcorum, Armada	471	wiltshirei, Lepidogma	704
typhae, Nonagria	382	wiltshirei, Leucoma	181
		wiltshirei, Ochropleura	231
uberalis, Candiope	635	wiltshirei, Pleurota	831
ulceratalis, Cornifrons	792	wiltshirei, Somatina	521
ultimaria, Eupithecia	552	wiltshirei, Syntomis (Amata)	162
ulula, Dyspessa	899		
umbraria, Boarmia	579	xanthographa, Amathes	248
*undalis, Hellula	765	xyleuta, Depressaria	817
undulata, Agrotis	216		
unicata, Cidaria	544	ypsillon, Sidemia	345
unita, Lithosia	171		
urania, Tarache	414	*zeae, Mythimna	276
urticae, Aglais	73	zeitunensis, Sterrha	508
		zernyi, Caradrina	375
vanensis, Euxoa	207	zernyi, Evergestis	770
variabilis, Nychiodes	575	zobeidah, Caradrina	370
variegana, Argyroploce	872		

INDEX OF LEPIDOPTEROUS PESTS OF IRAQ

(arranged in order of hosts)

In the following index, under the name of the cultivated plant, or tree, or the kind of stored products attacked by the pest in Iraq, is given simply the number, in the list, of the pest. If the number is in brackets, it means that the species has been observed to attack a wild relative of the cultivated plant or tree and may well attack the cultivated kind in future.

- ARTICHOKE. (*Cynara scolymus.*) (Arab. Kharshuf.)
71.
- BEE-HIVES.
686.
- BEET (*Beta vulgaris*) (Arab. Shuwandar) AND OTHER ROOT-CROPS.
209, 211, 365, 742, 767.
- BLOOD-FLOWER. (*Asclepias curassavica.*)
90.
- CABBAGE (*Brassica rapa.*) (Arab. Shalgham, Malfuf) AND OTHER CRUCIFEROUS VEGETABLES.
9, 11, 211, 765.
- CAROB (*Ceratonia siliqua.*) (Arab. Kharrub.)
421.
- CEREALS (BARLEY, CORN, MAIZE, SORGHUM, WHEAT, RICE.) (Arab. Sha'ir, Idhrah, Dhurah, Hintah, Ruzz.) (*Hordeum sativum, Zea mays, Sorghum vulgare, Triticum vulgare, Oryza sativa.*)
132, 276, 278, 371, 384, 385, 736, 802.
- CITRUS. (LEMON, LIME, ORANGE.) (Arab. Laimun, Burtugal, Narangi, etc.)
1.
- COTTON. (*Gossypium herbaceum.*) (Arab. Qutn.)
173, 363, 365, 421, 426.
- DATES. (*Phoenix dactylifera.*) (Arab. Tamr.)
594, 595, 596, 597, 598, 685, 808, 809.
- DILL (*Anethum graveolens*) (Arab. Sbint.)
1.
- DURANTA.
147.
- FIG. (*Ficus carica.*) (Arab. Tin.)
187. (See also under Stored Vegetable Products.)
- FLOWERS, VARIOUS GARDEN-
363, 393, 427, 428, 430, 431.
- FRUIT TREES OF ROSE FAMILY. (ALMOND, APPLE, APRICOT, CHERRY, GREENGAGE, PEACH, PEAR, PLUM.) (Arab. Loz, Tuffah, Mishmish, Goj, Khokh, 'Armut, Njas.) (*Amygdalus communis, Pyrus malus, Prunus armeniaca, Prunus cerasus, Prunus domestica, Prunus persica, Pyrus communis, etc.*)
3, 7, 134, (138), 145 (146), 184, (189, 309), 318, 425, (558, 559, 560), 575, 858, 874a, 893, 894.
- FURS AND WOOLLEN PRODUCTS.
(?) 879; 884.
- GRASS, LAWN-
208, 364, 751.
- HIBISCUS AND HOLLYHOCK. (*Hibiscus esculentus, etc., Althaea rosea.*) (Arab. Bamieh, Khatmiyah.) (INCLUDING OCHRA OR LADY'S FINGERS.)
71, 117, 365, 421.
- LUCERNE OR ALFALFA. (*Medicago sativa.*) (Arab. Jatt.)
25.

- MINT. (*Mentha*.) (Arab. Na'na'.)
787, (857).
- MYRTLE. (*Myrtus communis*.) (Arab. Yas.)
444.
- NASTURTIUM. (*Tropaeolum*.) (Arab. Latini.)
9.
- OLEANDER. (*Nerium oleander*.) (Arab. Difl.) AND PERIWINKLE. (*Vinca*)
152.
- PISTACHIO. (*Pistacia*.) (Arab. Fustiq.)
(144, 185, 189, 444, 538, 417, 418.)
- POMEGRANATE. (*Punica granatum*.) (Arab. Rumman.)
145, (?) 425, 445, 446.
- Pluchea dioscoridis*.
360.
- POPLAR (*Populus*) AND WILLOW (*Salix*.) (Arab. Gharab, Safsaf, Qauwagh.)
134, 145, 151, 182, 191, 192, 320, 419, 422, 423, 435, 436, 437, 438, 439, 462, 820, 876, 891,
892, 893, 894.
- PUMPKIN. (*Cucurbita*.) (Arab. Shijar.)
147.
- RUE. (*Ruta graveolens*.) (Arab. Sdhab.)
1, 431.
- SESAM. (*Sesamum indicum*.) (Arab. Simsim.)
365, 763.
- SNAPDRAGON. (*Antirrhinum majus*.) (Arab. Halq-as-Saba'.)
159.
- STORED VEGETABLE PRODUCTS. (DRIED FRUIT, CEREALS, STRAW, CHOCOLATE, NUTS, ETC.)
594, 595, 596, 597, 598, 698, 701, 703, 884.
- SWEET PEAS AND LEGUMINOUS CLIMBERS. (Arab. 'atr, badhiliah.)
44.
- SWEET POTATO AND MORNING GLORY. (*Ipomoea batata* and *purpurea*.)
148.
- TOMATO. (*Lycopersicum esculentum*.) (Arab. Tamatah, Banadurah.)
363, 394.
- VEGETABLES, Cruciferous, see Cabbage.
- VEGETABLES, GENERAL
211, 246, 363, 393, 427, 428, 430, 431.
- VEGETABLES, LEGUMINOUS. (PEA, BEAN, CHICK PEA, etc.) (*Pisum sativum*, *Vicia faba*, *Cicer arietinum*.)
(Arab. Bazallah, Baqlah, Humus.)
44, 307, 365, 393.
- VINE. (*Vitis vinifera*.) (Arab. 'ainab.)
153, 159, 160, 161, 873.

THE LEPIDOPTERA OF IRAQ

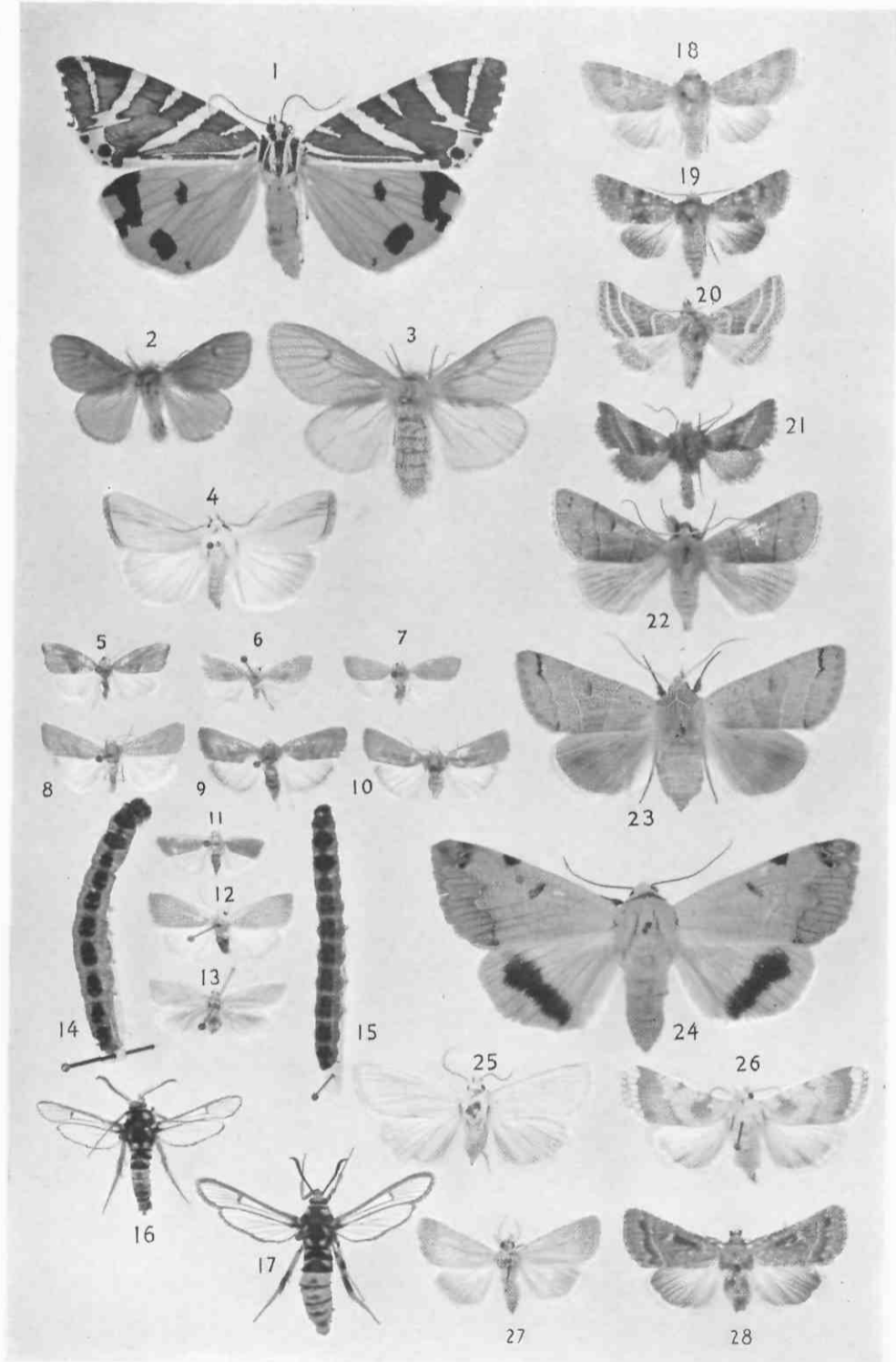
PLATES I—XVII

Species marked ** are known to have caused serious economic damage to crops or plantations.

Species marked * are known to attack crops or plantations.

Explanation of Plate I

- Fig. 1.—*Euplagia quadripunctaria* Poda subsp. *splendidior* Tams. (180)
Fig. 2.—*Ocnerogyia amanda* Stgr. ♂. ** (187)
Fig. 3.—*Ocnerogyia amanda* Stgr. ♀. ** (187)
Fig. 4.—*Xanthodes graellsii* Feist. * (426)
Fig. 5.—*Earias irakana* Wilts. f. *vernalis* Wilts. (gen. l.) (422)
Fig. 6.—*Earias irakana* Wilts. f. *intermedia* Wilts. (422)
Fig. 7.—*Earias irakana* Wilts. (422)
Fig. 8.—*Earias insulana* Boisd. ab. *anthophilana* Snell. ** (421)
Fig. 9.—*Earias insulana* Boisd. ab. *semifascia* Warr. ** (421)
Fig. 10.—*Earias insulana* Boisd. ** (421)
Fig. 11.—*Earias chlorophyllana* Stgr. (424)
Fig. 12.—*Earias chlorana* L. (423)
Fig. 13.—*Tortrix viridana* L. (859)
Fig. 14.—*Eriogaster philippsi* Bart. larva. (Lebanon.)
Fig. 15.—*Eriogaster* (?) *philippsi* Bart. subsp. larva. (Iraq.) (139)
*Fig. 16.—*Eusphecia pimplaeformis* Ob. ♂ (876)
*Fig. 17.—*Eusphecia pimplaeformis* Ob. ♀ (876)
Fig. 18.—*Mamestra rhodocharis* Brandt. ♂, paratype. (Fars.)
Fig. 19.—*Mamestra rhodocharis herkia* subsp. n. ♀, paratype. (Iraq.) (257)
Fig. 20.—*Metallopha liturata* Christ. (294)
Fig. 21.—*Metallopha gloriosa* Stgr. (293)
Fig. 22.—*Minucia bimaculata* Osth. (Iraq.) (443)
Fig. 23.—*Minucia bimaculata pulchrior* subsp. n. paratype. (Fars.) (443)
Fig. 24.—*Anua tirhaca* Cr. * (444)
Fig. 25.—*Dicycla oo* L. ab. *sulphurea* Stgr. ♀. (350)
Fig. 26.—*Dicycla oo* L. ♀. (350)
Fig. 27.—*Hadjina viscosa* Frr. subsp. *persicola* Strand. ♀ (gen. aest.) (360)
Fig. 28.—*Hadjina viscosa* Frr. subsp. *persicola* Strand. ♀ (gen. hib.) (360)
- (The numbers in brackets after the details refer to the position in the list.)



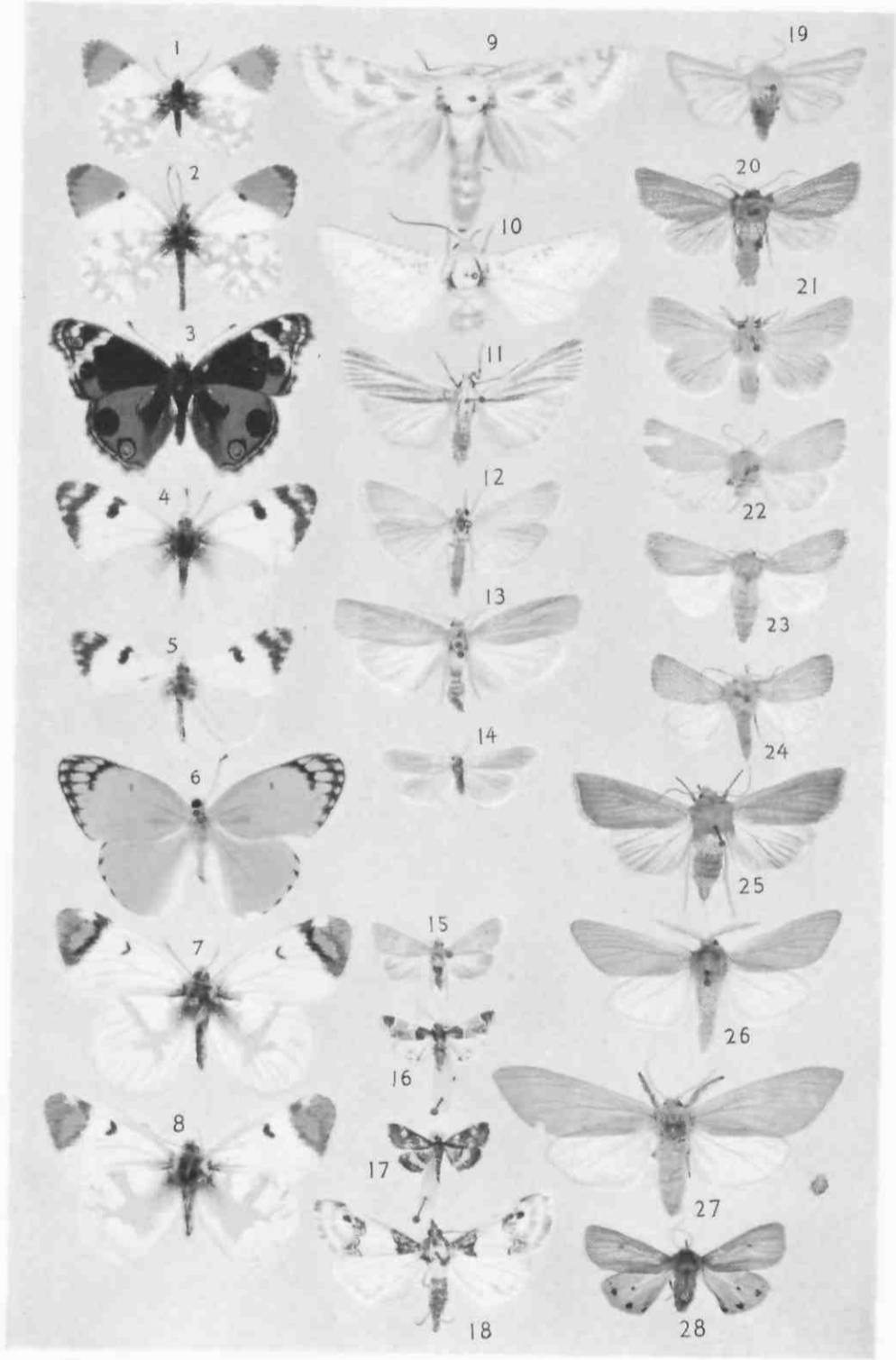
Natural size.

The Lepidoptera of Iraq

Explanation of Plate II

- Fig. 1.—*Anthocharis gruneri* H.-S. subsp. *armeniaca* Christ. ♂. (19)
Fig. 2.—*Anthocharis cardamines* L. subsp. *phoenissa* Stgr. ♂. (20)
Fig. 3.—*Junonia orithya* L. subsp. *here* Lang. ♂. (70)
Fig. 4.—*Anthocharis charlonia* subsp. *transcaspica* Stgr. (22)
Fig. 5.—*Anthocharis charlonia* subsp. *mesopotamica* Stgr. (22)
Fig. 6.—*Colotis fausta* Oliv. ♀. (24)
Fig. 7.—*Zegris eupheme* subsp. *dyala* Riley (23)
Fig. 8.—*Zegris eupheme* subsp. *tigris* Riley (23)
Fig. 9.—*Holcocerus gloriosus* Ersch. subsp. *mesopotamicus* Watk. ♀. (895)
Fig. 10.—*Holcocerus gloriosus* Ersch. subsp. *laudabilis* Stgr. ♀. (895)
Fig. 11.—*Myelois pumicosa* Led. ♀. (674)
Fig. 12.—*Shirazia monotona* Ams. ♀. (684)
Fig. 13.—*Arenipses sabella* Hamps. ♀. ** (685)
Fig. 14.—*Lithosia muscula* Stgr. *brevifurca* subsp. n. (170)
Fig. 15.—*Loxostege nudalis* Hamps. ** (767)
Fig. 16.—*Pyralis farinalis* L. * (701)
Fig. 17.—*Pyrausta meridionalis* Stgr. * (787)
Fig. 18.—*Aeglotis argentalis* Christ. (730)
Fig. 19.—*Oria musculosa* Hübn. * (385)
Fig. 20.—*Epipsammia boursini* sp. n. (386)
Fig. 21.—*Arenostola delattini* Wilts. (Fars.)
Fig. 22.—*Arenostola phragmitidis* Hübn. (Iraq.) (381)
Fig. 23.—*Sesamia cretica* Led. ** (384)
Fig. 24.—*Mythinna alopecuri* B. subsp. *syriaca* Osth. (273)
Fig. 25.—*Mythinna languida* Stgr. (277)
Fig. 26.—*Sumeria dipotamica* Tams. ♂. (198)
Fig. 27.—*Sumeria dipotamica* Tams. ♀. (198)
Fig. 28.—*Phragmatobia fuliginosa* L. subsp. *pulverulenta* Alph. (179)

(The numbers in brackets after the details refer to the position in the list.)



Natural size

The Lepidoptera of Iraq

Explanation of Plate III

Figs. 1-5.—*Papilio machaon* L. subsp. *centralis* Stgr. * (1)

Fig. 1.—Adult gen. 1.

Fig. 2.—Adult gen. 3.

Fig. 3.—Larva f. *albicans* (summer extreme form) (f.n.)

Fig. 4.—Larva f. *nigricans* Frion. (winter form)

Fig. 5.—Larva f. *nigricans* Frion. (winter extreme form)

(N.B.—Figs. 1 and 2 are reduced in size.)

Fig. 6.—*Epinephele jurtina* L. subsp. *persica* LeCerf. ♂. (108)

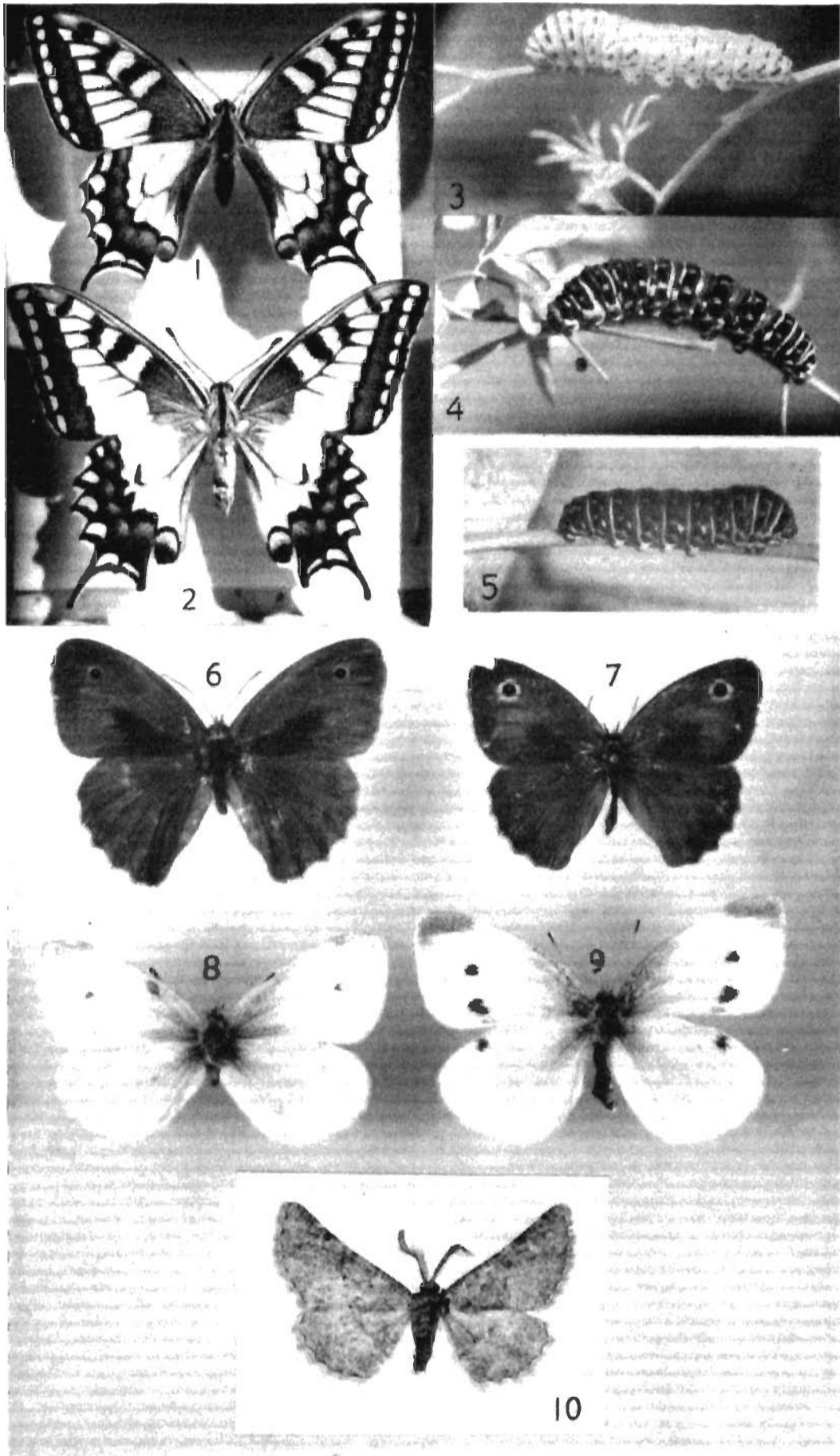
Fig. 7.—*Epinephele telmessia* Z. subsp. *kurdistana* Ruhl. ♂. (109)

Fig. 8.—*Pieris rapae* L., ♂. ** (9)

Fig. 9.—*Pieris rapae* L., ♀. ** (9)

Fig. 10.—*Nychiodes rayatica* sp. n., ♂. (576)

(The numbers in brackets after the details refer to the position in the list.)



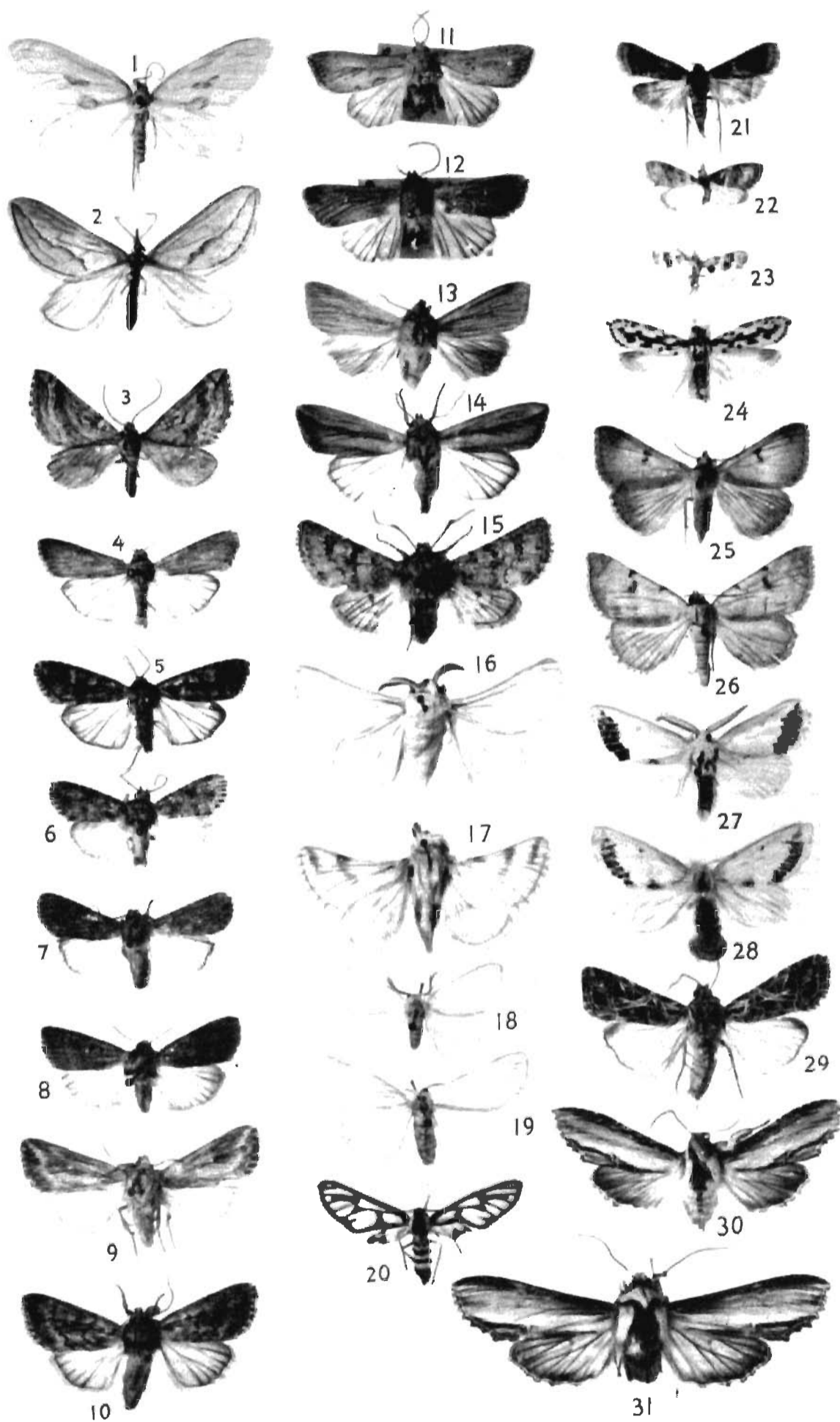
Natural size

The Lepidoptera of Iraq

Explanation of Plate IV

- Fig. 1.—*Chesias korbi* Boh. subsp. *taurica* Wli. (537)
Fig. 2.—*Lithostege buxtoni* Prout. (530)
Fig. 3.—*Lithostege dissocyma* Prout, holotype (531)
Fig. 4.—*Laphygma exigua* Hübn. (gen. aestiv.) ** (365)
Fig. 5.—*Laphygma exigua* Hübn. (gen. vern.) ** (365)
**Fig. 6.—*Spodoptera ciliium* Gn. subsp. *latebrosa* Led. (364)
**Fig. 7.—*Spodoptera ciliium* Gn. subsp. *latebrosa* Led. (364)
Fig. 8.—*Caradrina zobeidah* Boursin. (gen. l. vern.) (370)
Fig. 9.—*Mythimna punctosa* Tr. (274)
Fig. 10.—*Mythimna herrichii* H.-S. (275)
Fig. 11.—*Mythimna zea* Dup. * (276)
Fig. 12.—*Mythimna zea* Dup. * (276)
Fig. 13.—*Mythimna congrua* Hübn. (272)
Fig. 14.—*Mythimna loreyi* Dup. * (278)
Fig. 15.—*Artitype carducha* sp. n. ♂ (313)
Fig. 16.—*Chondrostega fasciana* Stgr. subsp. *feisali* Wilts. ♂ (137)
Fig. 17.—*Chondrostega fasciana* Stgr. subsp. *feisali* Wilts. ♂ (137)
Fig. 18.—*Leucoma wiltshirei* Coll. ♂ (181)
Fig. 19.—*Leucoma wiltshirei* Coll. ♀ (181)
Fig. 20.—*Amata wiltshirei* B.-Salz. ♀ (162)
Fig. 21.—*Bostra marginalis* Roths. ♀ (696)
Fig. 22.—*Celama harouni* Wilts. (165)
Fig. 23.—*Celama turanica* Stgr. (166)
Fig. 24.—*Ethmia pusiella* Roem. (811)
Fig. 25.—*Plecoptera reflexa* Guen. (459)
Fig. 26.—*Plecoptera inquinata* Led. (460)
Fig. 27.—*Porthesia melania* Stgr. ♂ (188)
Fig. 28.—*Porthesia melania* Stgr. ♀ (188)
Fig. 29.—*Prodenia litura* F. ** (363)
Fig. 30.—*Cucullia strigicosta* Boursin, holotype (284)
Fig. 31.—*Cucullia verbasci* L. (285)

(The numbers in brackets after the details refer to the position in the list.)



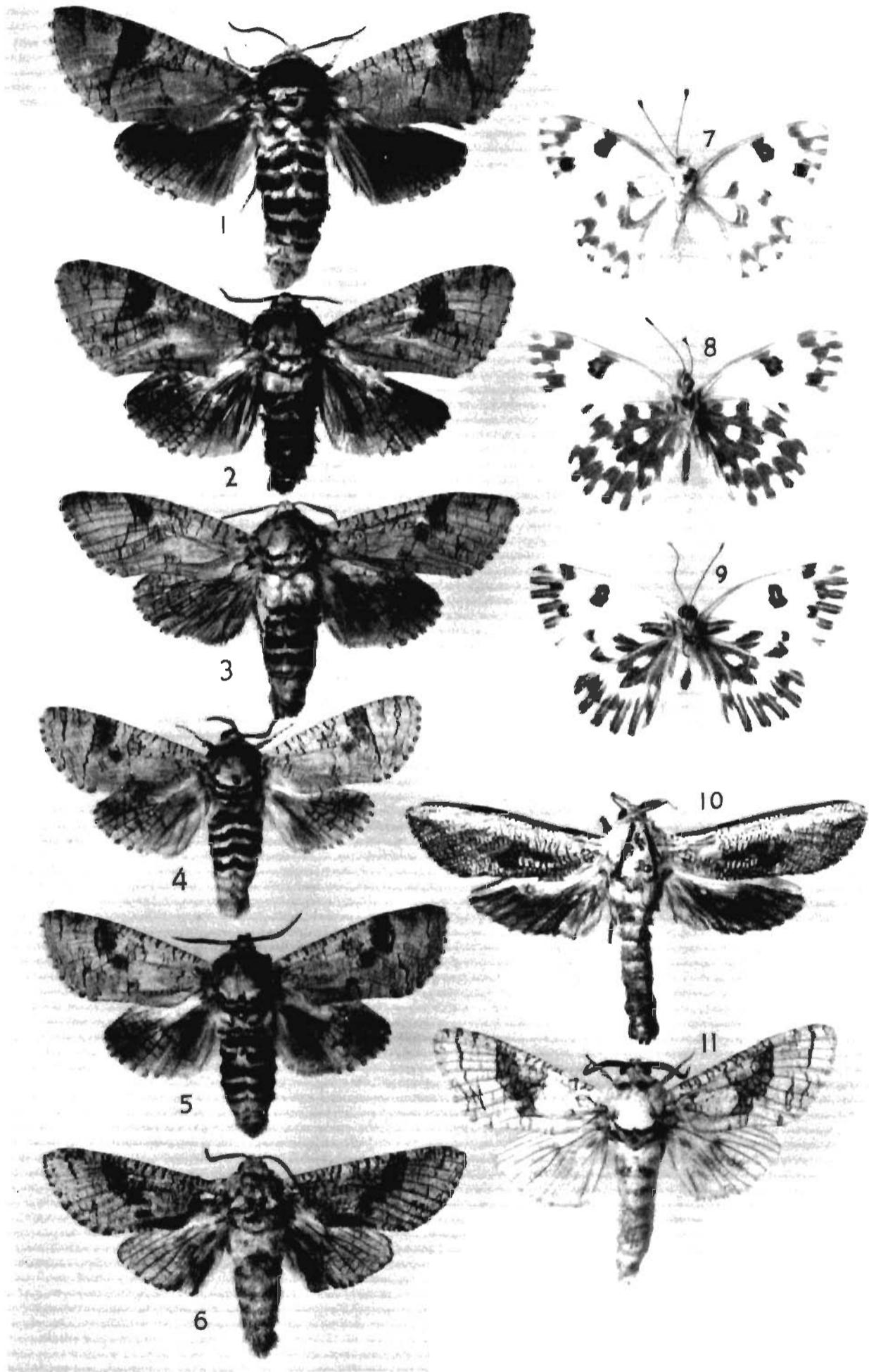
Natural size

The Lepidoptera of Iraq

Explanation of Plate V

- Figs. 1-3.—*Cossus cossus* L. *kossai* subsp. n. ♂. * (891)
Figs. 4-5.—*Cossus cossus* L. *omrana* subsp. n. ♂. (* 891)
Fig. 6.—*Dyspessacossus fereidun* Gr.-Gsh. *ahmadi* subsp. n. ♂. * (892)
Fig. 7.—*Pontia glauconome* Klug, subsp. *iranica* Bien. (underside) (13)
Fig. 8.—*Pontia daplidice* L. (underside) (12)
Fig. 9.—*Euchloe chloridice* Hübn. (underside) (16)
Fig. 10.—*Zenzera regina* Stgr. ♂. * (893)
Fig. 11.—*Dyspessacossus fereidun* Gr.-Gsh. ♂. * (892)

(The numbers in brackets after the details refer to the position in the list.)



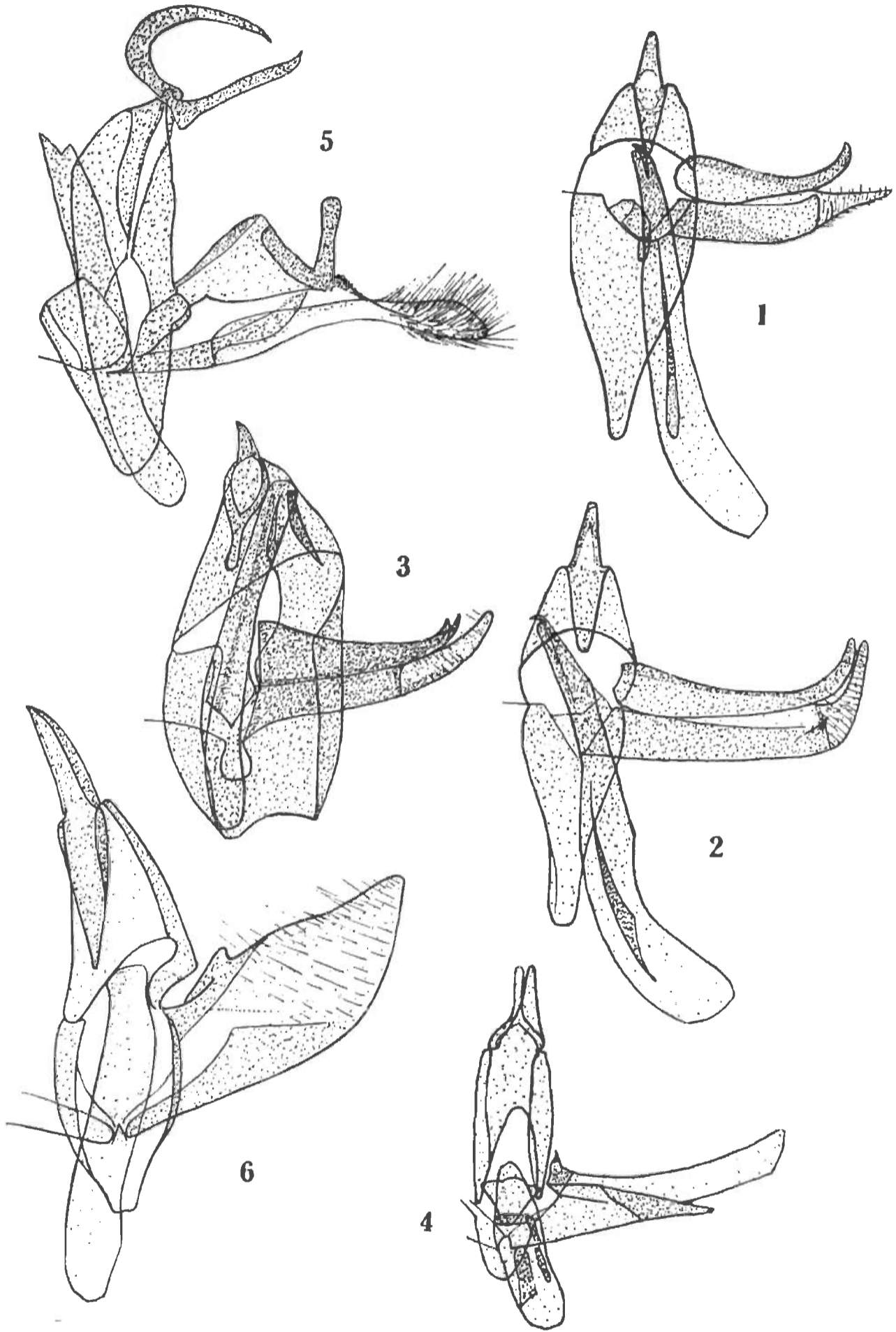
Natural size

The Lepidoptera of Iraq

Explanation of Plate VI

- Fig. 1, 2.—*Crambus desertellus* Led., male genitalia (719)
Fig. 3.—*Crambus stenopterellus* Ams., ditto (720)
Fig. 4.—*Eromene rayatella* Ams., ditto (725)
Fig. 5.—*Cephis buxtoni* Roths. (*hederalis* Ams.), ditto (735)
Fig. 6.—*Diatraea* sp. (734)

PLATE VI

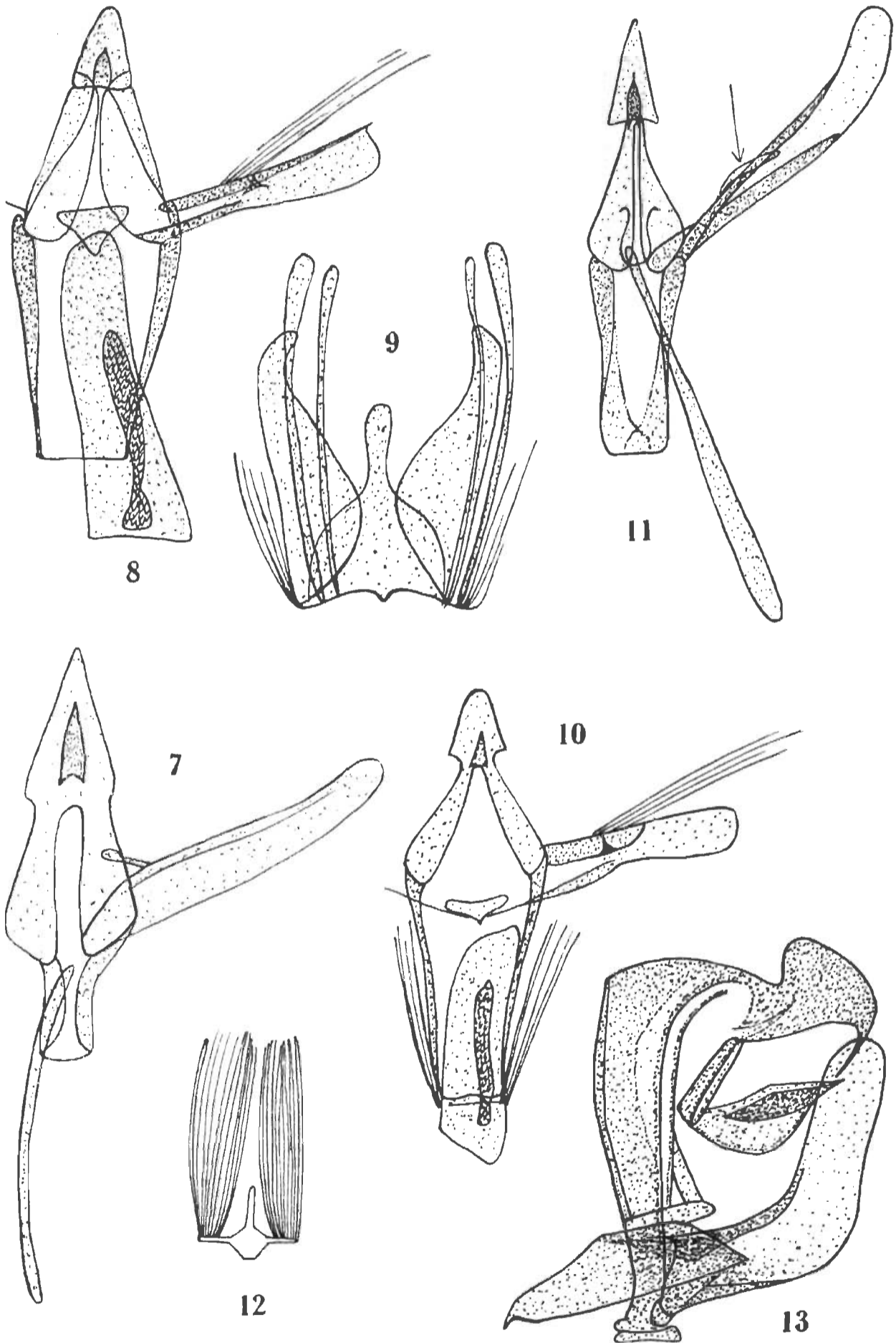


The Lepidoptera of Iraq

Explanation of Plate VII

- Fig. 7.—*Heterographis concavella* Ams., male genitalia (608)
Fig. 8.—*Ancylodes pallens* Rag., ditto (Tunisia)
Fig. 9.—*Ancylodes pallens* Rag., coremata and octavals.
Fig. 10.—*Ancylodes kerbelella* Ams., male genitalia (601)
Fig. 11.—*Cornigerula eremicola* Ams., male genitalia (605)
Fig. 12.—*Cornigerula eremicola* Ams, coremata and octavals.
Fig. 13.—*Ancylolomia tentaculella* Hübn. (= *irakella* Ams.), male genitalia (728)

PLATE VII

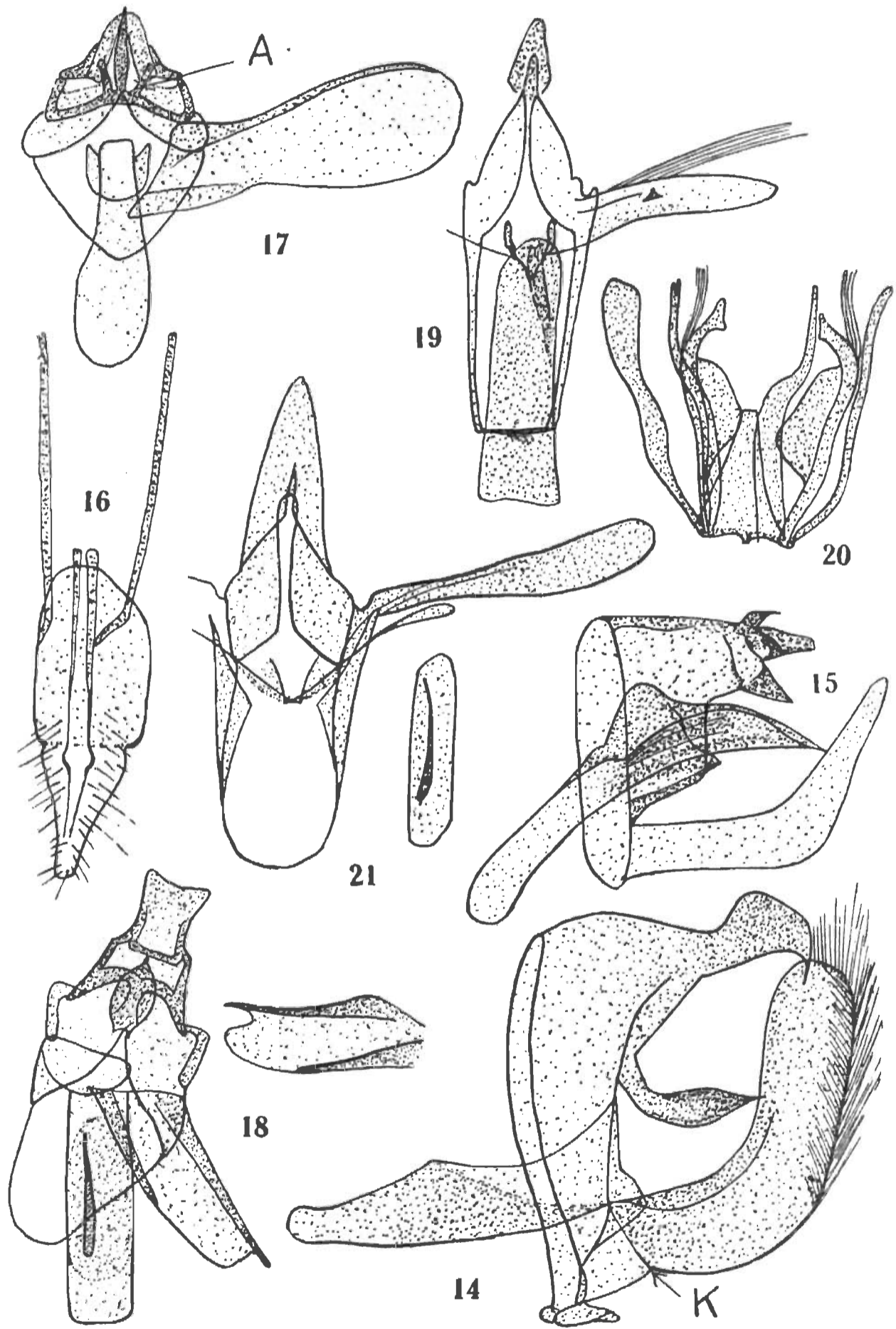


The Lepidoptera of Iraq

Explanation of Plate VIII

- Fig. 14.—*Ancylolomia tentaculella* Hübn., male genitalia (728)
Fig. 15.—*Tollia pectinatella* Z., ditto (729)
Fig. 16.—*Ciliocera leucosarca* Meyr., female genitalia (680)
Fig. 17.—*Ahwazia albicostalis* Ams., male genitalia (624)
Fig. 18.—*Pristophora alphetopis* Meyr., ditto (628)
Fig. 19.—*Epischnia arabica* Ams., ditto (672)
Fig. 20.—*Epischnia arabica* Ams., coremata and octavals.
Fig. 21.—*Tephris stenopterella* Ams., male genitalia (653)

PLATE VIII

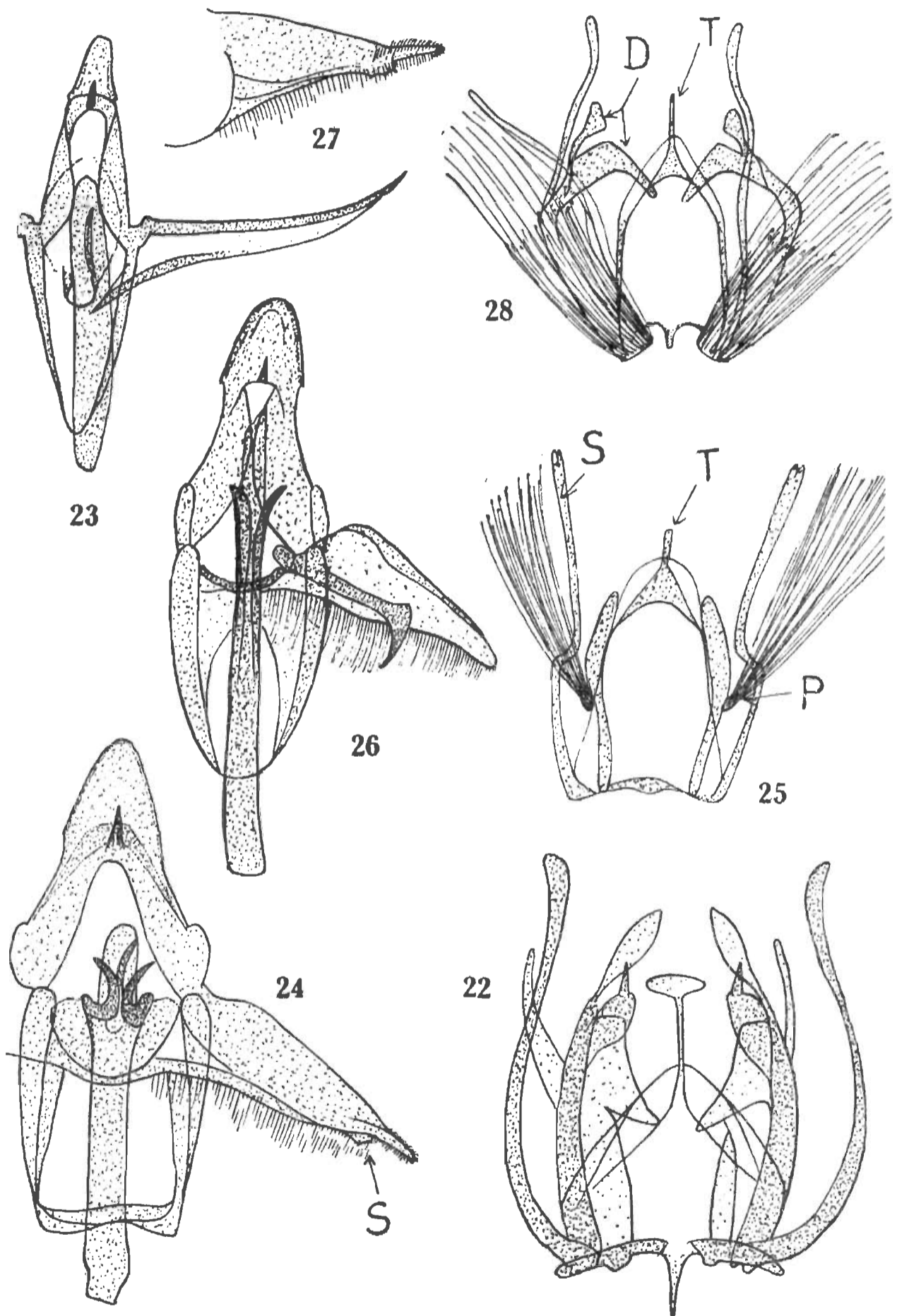


The Lepidoptera of Iraq

Explanation of Plate IX

- Fig. 22.—*Tephris stenopterella* Ams., coremata and octavals (653)
Fig. 23.—*Praesalebria argyrophanes* Meyr., male genitalia (654)
Fig. 24.—*Salebria brephiella* Stgr., ditto (Corsica)
Fig. 25.—*Salebria brephiella* Stgr., coremata and octavals.
Fig. 26.—*Salebria zelicella* Ob., male genitalia (Palestine)
Fig. 27.—*Salebria coremetella* Ams., male valve (658)
Fig. 28.—*Salebria coremetella* Ams., coremata and octavals.

PLATE IX

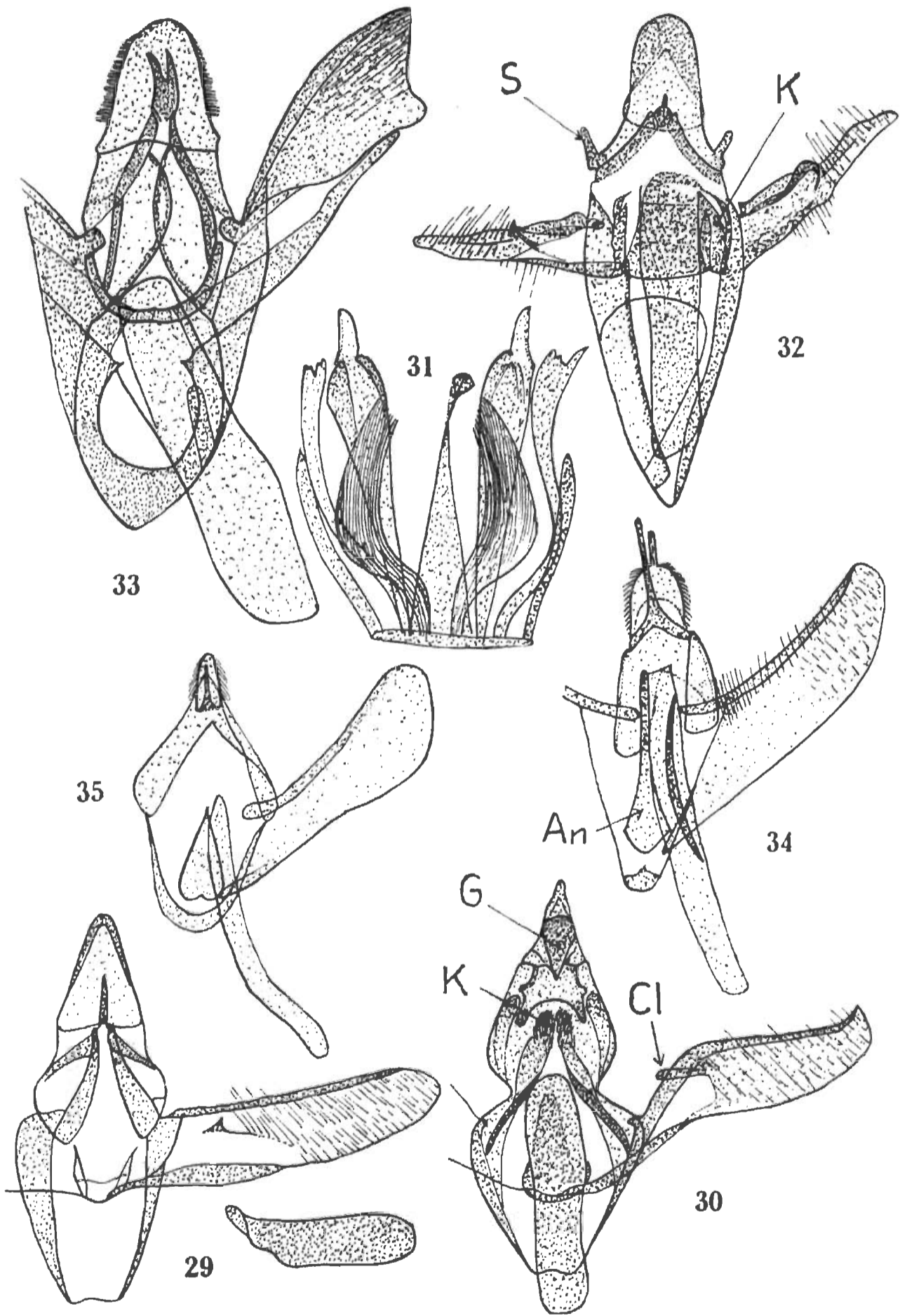


The Lepidoptera of Iraq

Explanation of Plate X

- Fig. 29.—*Nephoteryx eustatica* Meyr., male genitalia (651)
Fig. 30.—*Ichorarchis iozona* Meyr., ditto (646)
Fig. 31.—*Ichorarchis iozona* Meyr., octavals and coremata.
Fig. 32.—*Ptyonocera proteroleuca* Meyr., male genitalia (645)
Fig. 33.—*Myelois margaritella* Tur., ditto (679)
Fig. 34.—*Scoparia phycophanes* Meyr., male genitalia (738)
Fig. 35.—*Scoparia piroformis* Ams., ditto (740)

PLATE X

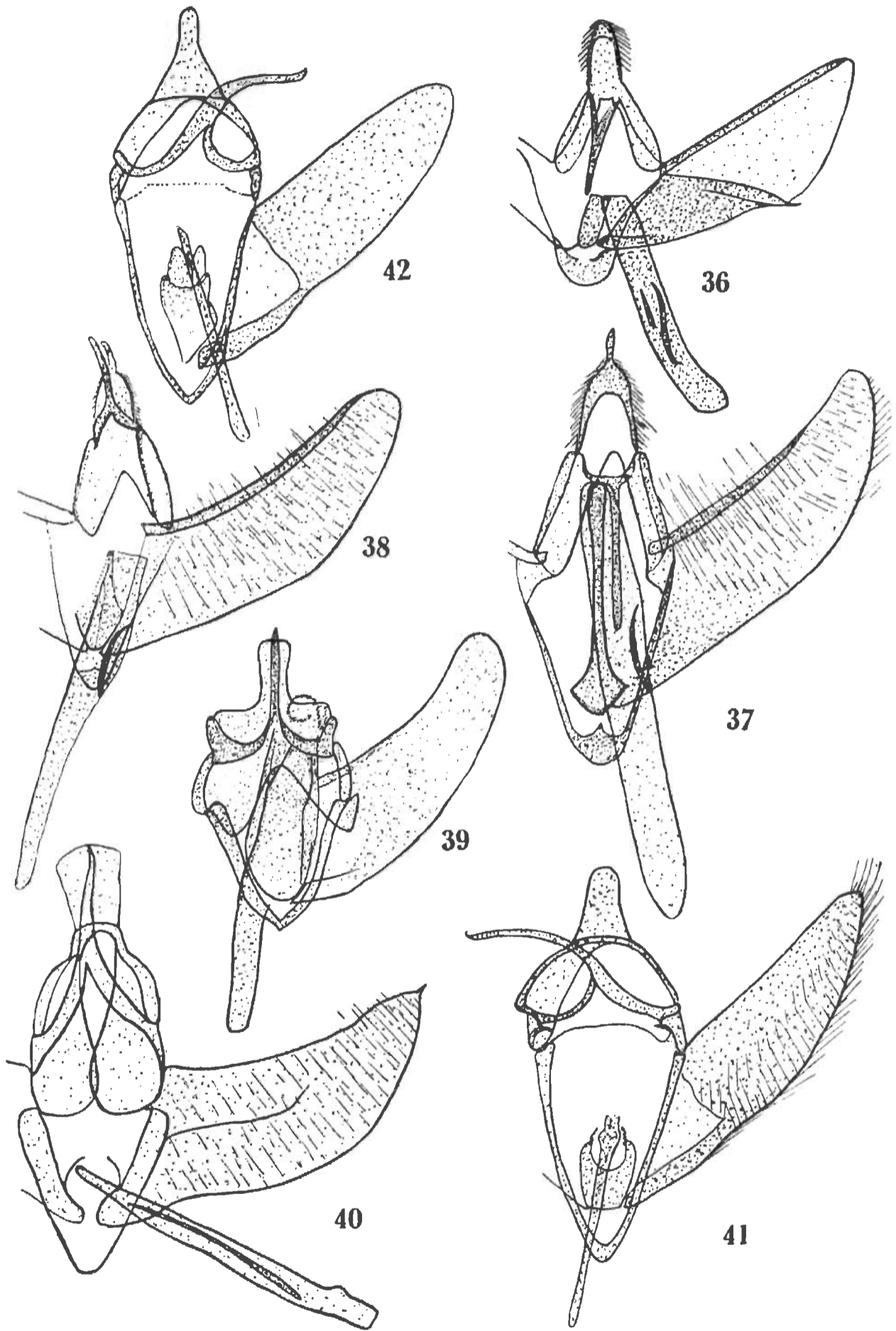


The Lepidoptera of Iraq

Explanation of Plate XI

- Fig. 36.—*Scoparia saerdabella* Osth., male genitalia (Elburz Mts.)
Fig. 37.—*Scoparia rupestris* Meyr., ditto (739)
Fig. 38.—*Scoparia rupestris* Meyr., ditto (739)
Fig. 39.—*Constantia wiltshirei* Ams., ditto (712)
Fig. 40.—*Lepidogma wiltshirei* Ams., ditto (704)
Fig. 41.—*Bostra minimalis* Ams., ditto (694)
Fig. 42.—*Bostra atomalis* Ams., ditto (Iran)

PLATE XI

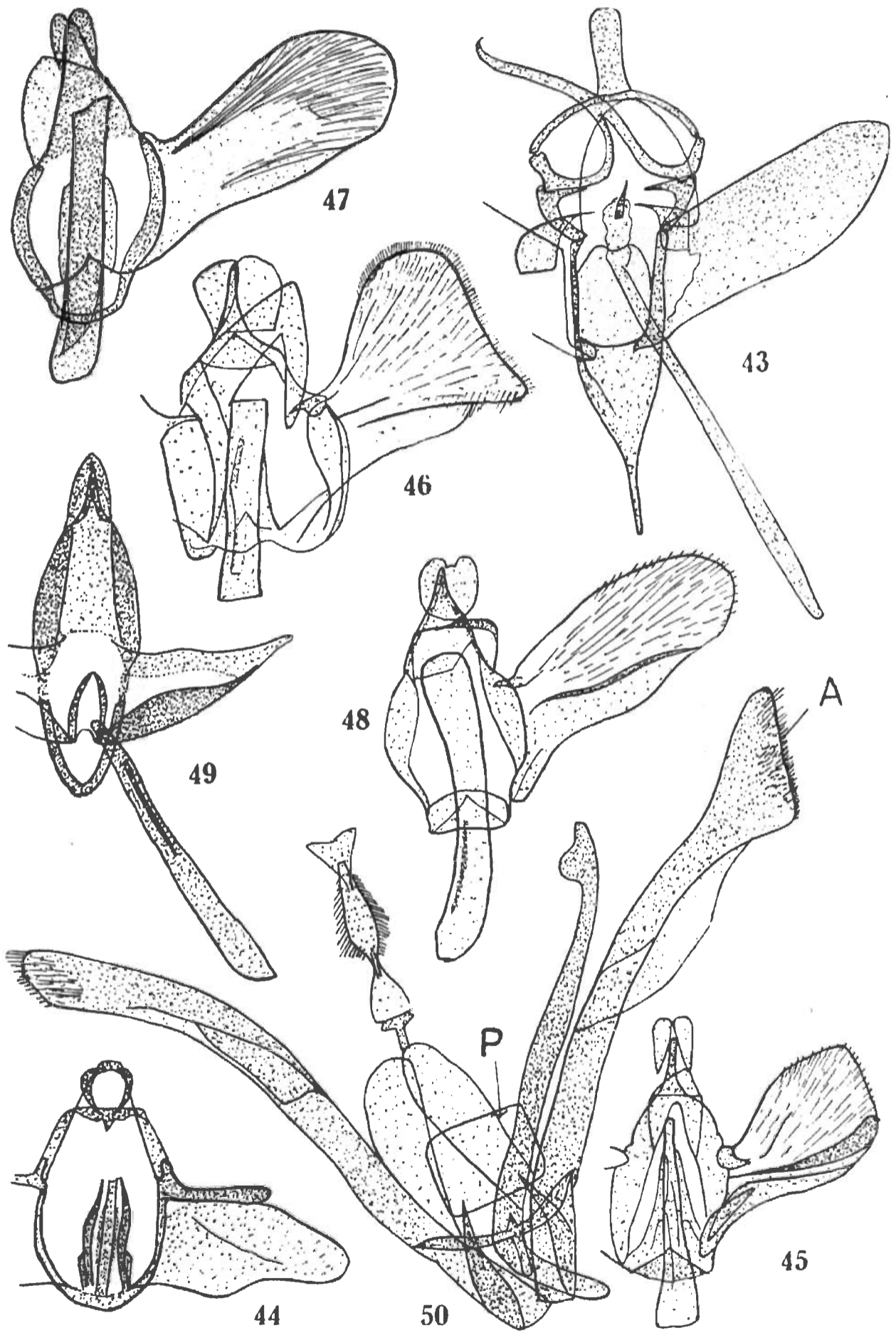


The Lepidoptera of Iraq

Explanation of Plate XII

- Fig. 43.—*Bostra marginalis* Roths., male genitalia (696)
Fig. 44.—*Krombia pulchella* Ams., ditto (699)
Fig. 45.—*Tegostoma comparalis* Hübn., ditto (Sardinia)
Fig. 46.—*Tegostoma mossulalis* Ams., ditto (794)
Fig. 47.—*Tegostoma ahwazalis* Ams., ditto (Iran)
Fig. 48.—*Kerbela monotona* Ams., ditto (800)
Fig. 49.—*Cybolomia haplogramma* Meyr., ditto (760)
Fig. 50.—*Agdistis tamaricis* Z. (= *bagdadiensis* Ams.), ditto (842)

PLATE XII

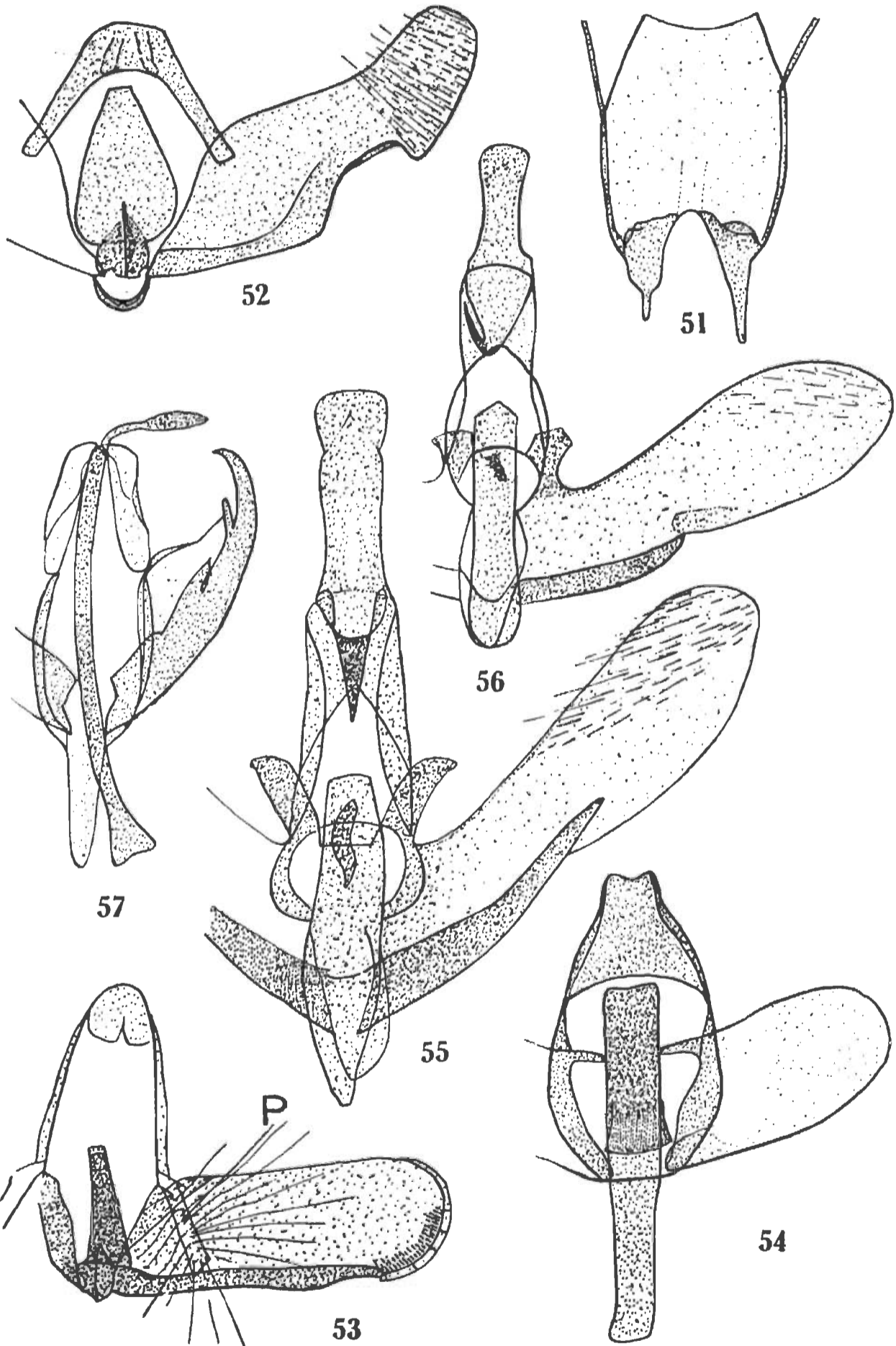


The Lepidoptera of Iraq

Explanation on Plate XIII

- Fig. 51.—*Agdistis tamaricis* Z. (= *bagdadiensis* Ams.), sternite 9 (842)
Fig. 52.—*Eucosma esmodes* Meyr., male genitalia (865)
Fig. 53.—*Semasia bagdadiana* Ams., ditto (870)
Fig. 54.—*Atychia mesopotamica* Ams., ditto (875)
Fig. 55.—*Symmoca costobscurella* Ams., ditto (835)
Fig. 56.—*Symmoca kalifella* Ams., ditto (833)
Fig. 57.—*Depressaria obolucha* Meyr., ditto (816)

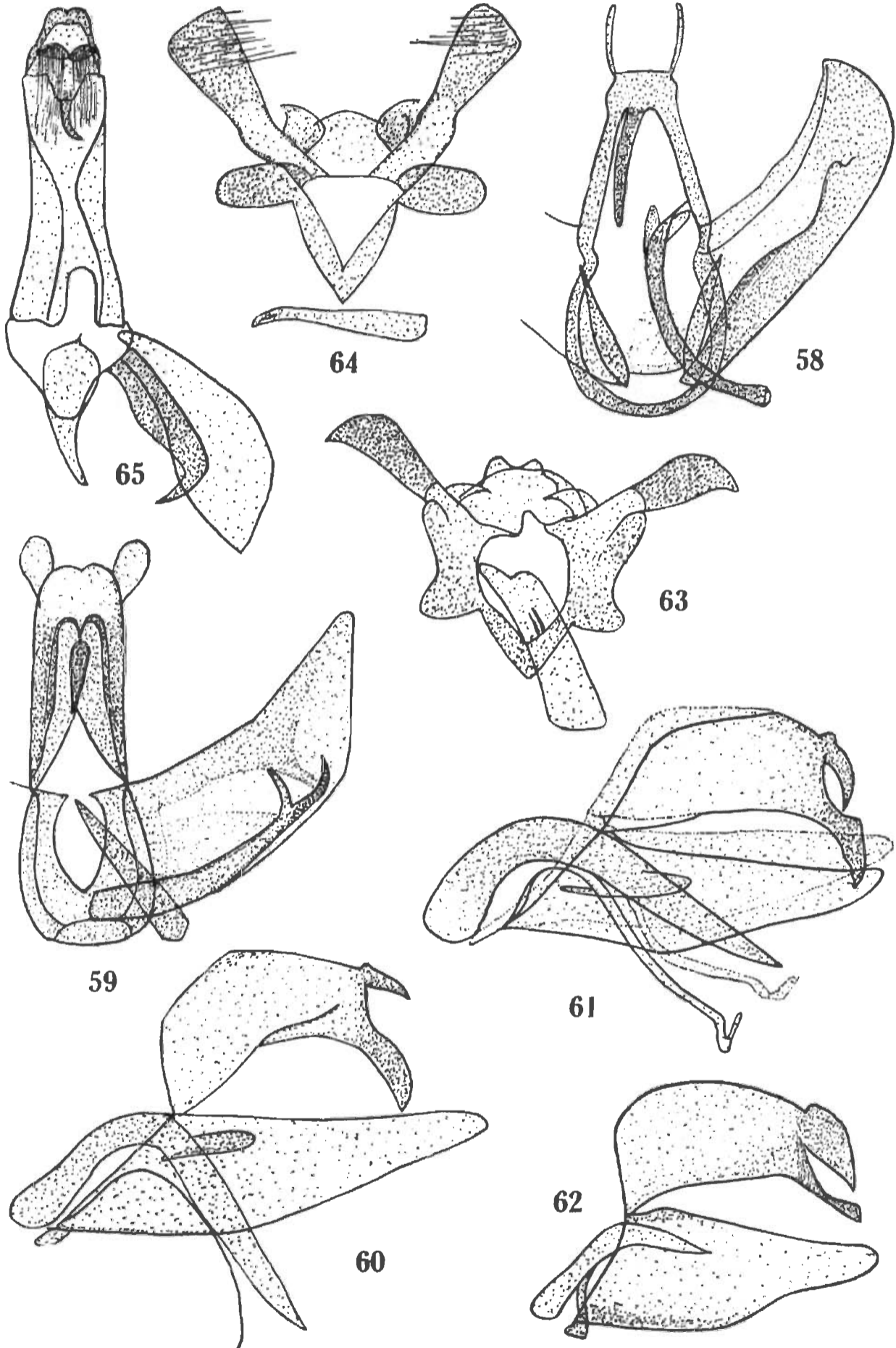
PLATE XIII



Explanation of Plate XIV

- Fig. 58.—*Depressaria mesopotamica* Ams., male genitalia (Iran)
Fig. 59.—*Depressaria xyleuta* Meyr., ditto (817)
Fig. 60.—*Pleurota kerbelella* Ams., ditto (829)
Fig. 61.—*Pleurota generosella* Reb., ditto (830)
Fig. 62.—*Pleurota wiltshirei* Ams., ditto (831)
Fig. 63.—*Metzneria diamondi* Ams., ditto (806)
Fig. 64.—*Bagdadia irakella* Ams., ditto (807)
Fig. 65.—*Gelechia bathrosticta* Meyr., ditto (821)

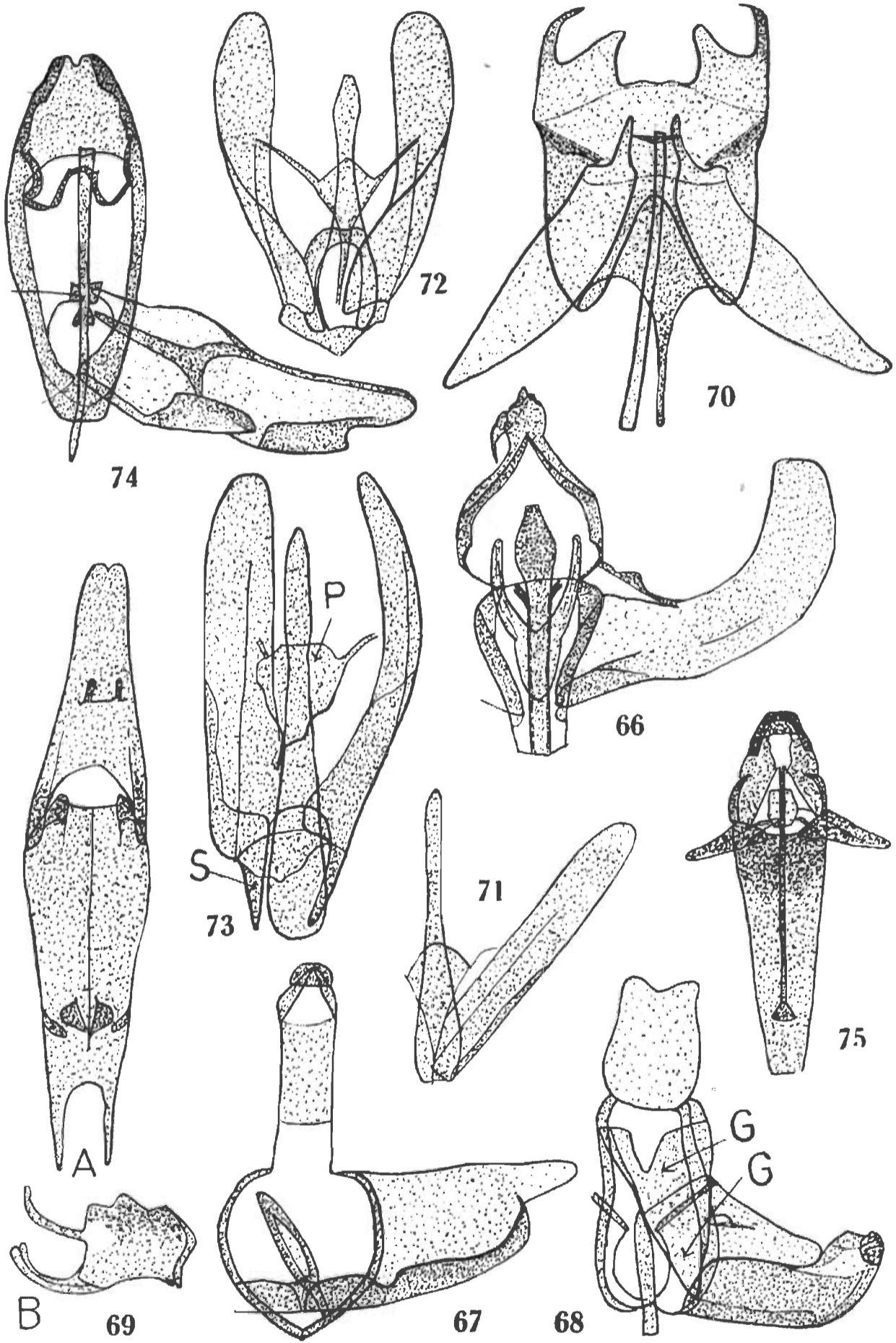
PLATE XIV



Explanation of Plate XV

- Fig. 66.—*Asbolistis chthoniopa* Meyr., male genitalia (828)
Fig. 67.—*Enscepastra machimopis* Meyr., ditto (841)
FIG. 68.—*Wiltshireia alba* Ams. (ditto) (Iran).
Fig. 69.—*Scythris bagdadiella* Ams. (A) 9th sternite and tergite, opened. (B) male genitalia, lateral view (803)
Fig. 70.—*Tinaea irakella* Ams., male genitalia (883)
Fig. 71.—*Hapsifera luridella* Z., ditto (Palestine)
Fig. 72.—*Hapsifera asiatica* Ams., ditto (886)
Fig. 73.—*Hapsifera kerbelella* Ams., ditto. (P): anellus-plate; (s) produced base of valva. (N.B.—Left valva is shown laterally, right valva ventrally) (887)
Fig. 74.—*Rhodobates atactopis* Meyr., male genitalia (885)
Fig. 75.—*Nemotois antilyca* Meyr., ditto (905)

PLATE XV

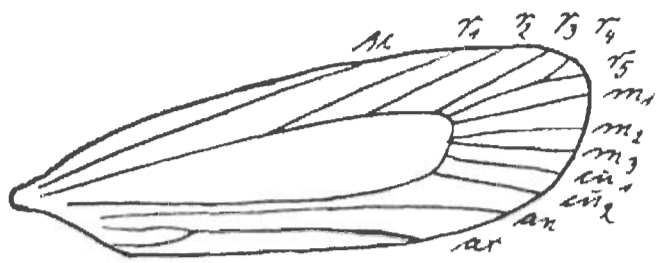


The Lepidoptera of Iraq

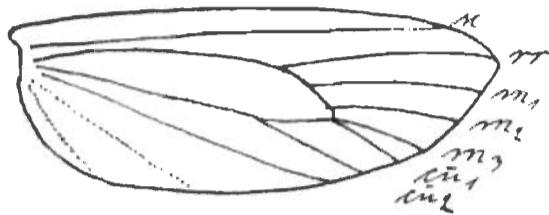
Explanation of Plate XVI

- Fig. 76.—*Wiltshireia alba* Ams. venation of fore and hind wing (Iran)
Fig. 77.—*Gelechia bathrosticta* Meyr. venation of fore wing (821)
Fig. 78.—*Bagdadia irakella* Ams., ditto (807)
Fig. 79.—*Bagdadia irakella* Ams., venation of hind wing (807)
Fig. 80.—*Asbolistis chthoniopa* Meyr., ditto, fore wing (828)
Fig. 81.—*Asbolistis chthoniopa* Meyr., ditto, hind wing (828)
Fig. 82.—Formation of frons in lateral (right) and dorsal (left) view in:
(A) *Tegostoma comparalis* Hübn. (Sardinia)
(B) *Anthophilopsis baphialis* Led. (796)
(C) *Aeschremon disparalis* H.-S. (797)
(D) *Kerbela monotona* Ams. (800)
(E) *Turania pentodontalis* Ersch.
(F) *Emprepes pudicalis* Dup.
(G) *Emprepes russulalis* Chr. (798)

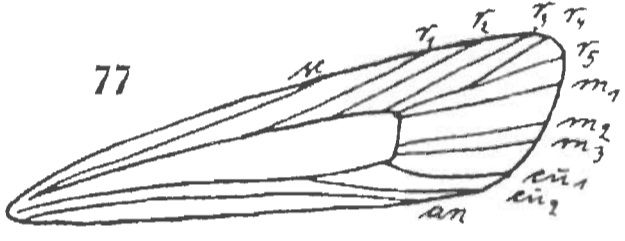
PLATE XVI



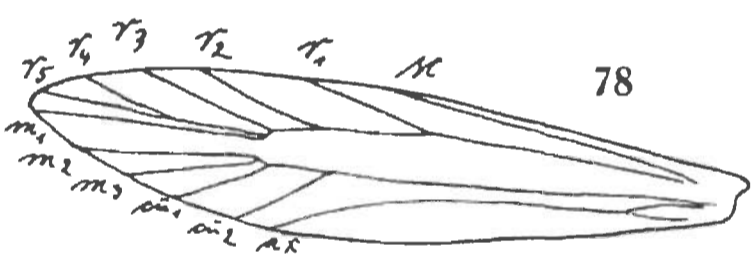
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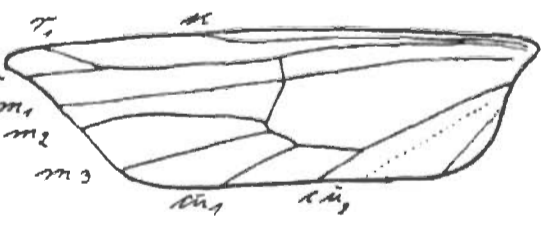
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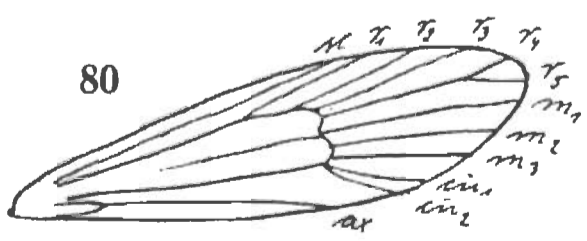
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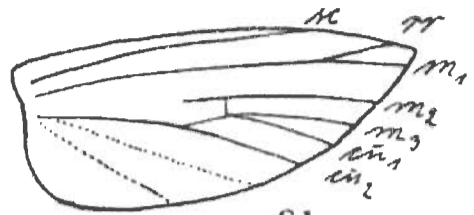
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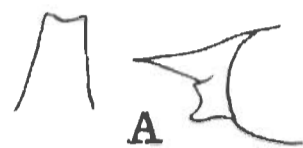
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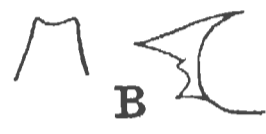
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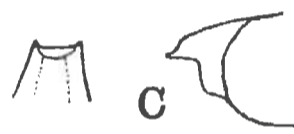
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A



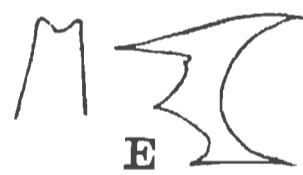
B



C



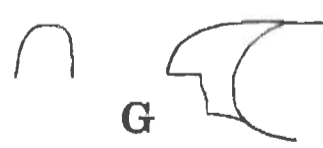
D



E



F



G

Explanation of Plate XVII

- Fig. 83.—*Crambus stenopterellus* Ams., fore wing (720)
Fig. 84.—*Heterographis concavella* Ams., ditto (608)
Fig. 85.—*Ichorarchis iozona* Meyr., ditto (646)
Fig. 86.—*Tephris stenopterella* Ams., ditto (653)
Fig. 87.—*Praesalebria argyrophanes* Meyr., ditto (654)
Fig. 88.—*Nephopteryx eustatica* Meyr., ditto (651)
Fig. 89.—*Ptyonocera proteroleuca* Meyr., ditto (645)
Fig. 90.—*Bostra minimalis* Ams., ditto (694)
Fig. 91.—*Lepidogma wiltshirei* Ams., ditto (704)
Fig. 92.—*Constantia wiltshirei* Ams., ditto (712)
Fig. 93.—*Cybolomia haplogramma* Meyr., ditto (760)
Fig. 94.—*Cybolomia triplacogramma* Meyr., ditto (761)
Fig. 95.—*Tegostoma ahwazalis* Ams., ditto (Iran)
Fig. 96.—*Marasmarcha leucocrossa* Meyr., ditto (846)
Fig. 97.—*Krombia pulchella* Ams., ditto (699)
Fig. 98.—*Semasia bagdadiana* Ams., ditto (870)
Fig. 99.—*Bagdadia irakella* Ams., ditto (807)
Fig. 100.—*Symmoca costobscurella* Ams., ditto (835)
Fig. 101.—*Scythris bagdadiella* Ams., ditto (803)
Fig. 102.—*Phlyctaenodes sinuosalis* Le C., fore and hind wing (775)

PLATE XVII

